

Department of Natural Resources
Resource Assessment Service
MARYLAND GEOLOGICAL SURVEY
Richard Ortt, Director

HYDROGRAPHS AND TABLES SHOWING GROUND-WATER LEVEL AND
PUMPAGE RECORDS FOR SELECTED OBSERVATION WELLS
IN ANNE ARUNDEL COUNTY, MARYLAND

AND

HYDROGRAPH SHOWING SURFACE-WATER FLOW
IN SAWMILL CREEK

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Prepared in cooperation with the
Anne Arundel County Department of Public Works

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SUMMARY

This report presents water-level data for 41 observation wells in Anne Arundel County updated through June 2020. Water-levels are tabulated for measurements from July 2019 to June 2020. Hydrographs are shown for the entire period of record at each site. Data, collected by the Maryland Geological Survey (MGS), are stored in the National Water Information System (Groundwater Site Inventory database), maintained by the U.S. Geological Survey. Groundwater Historical and additional groundwater data may be obtained from the U.S. Geological Survey website at <http://waterdata.usgs.gov/nwis/gw> or through an interactive map on the MGS website at http://www.mgs.md.gov/groundwater/water_level_mapper.html. This report also presents groundwater withdrawals correlated with water levels in 8 observation wells in the Crofton Meadows and Arnold well fields from July 2019 to June 2020. Pumpage data were obtained from Anne Arundel County Department of Public Works.

Since monitoring began in 2004, water levels in the **Aquia aquifer** in Southern Anne Arundel County at the Deale Athletic Field (AA Fe 92) have declined from about 24 ft in 2004 to 34.13 ft below sea level in 2019. While fluctuating by as much as ~5 feet as a result of local pumpage, the overall water-level trend since about 2006 has been relatively flat. The flattening of the trend is largely a result of a reduction of withdrawals from the Aquia aquifer in St. Mary's County as pumpage was shifted to the deeper Upper Patapsco aquifer to avoid elevated arsenic concentrations in the Aquia.

Water levels in the **Magothy aquifer** range from 1.79 ft above sea level west of Annapolis (AA Dd 42) to 24.4 ft below sea level in Broad Neck (AA Cf 99). Overall, water levels show a relatively flat trend over the last few years with the exception of AA Dd 42 which continues to decline.

Water levels in the **Upper Patapsco aquifer** range from 72.15 ft above sea level in northern Anne Arundel County (AA Ad 108) to 35.04 ft below sea level at the Broad Creek Water Treatment Plant (AA De 95). Recent water-level trends in the Upper Patapsco aquifer are stabilizing or recovering, especially at Amberly (AA Cf 134) and in the Glen Burnie area, (AA Bd 159) which recovered as much as 3 feet since 2019.

Water levels in the **Lower Patapsco aquifer** range from 77.33 ft above sea level in northern Anne Arundel County (AA Bd 160) to 75.44 ft below sea level in the Arnold well field (AA Cf 167). Water-level trends in the Lower Patapsco aquifer are stable or recovering in the Glen Burnie area. In the Crofton Meadows well field, water levels respond to withdrawals but show a relatively stable trend. Recent pumpage at the Crofton Meadows well field ranged from the highest, 9.05 million gallons per day (Mgal/d) (June 2020) to the lowest, 5.4 Mgal/d (April 2020). The water-level trend at the Arnold well field (AA Cf 137 and AA Cf 167) has remained stable (AA Cf 167) or is recovering (AA Cf 137). Recent pumpage at Arnold ranged from the highest, 7.13 Mgal/d (June 2020), to the lowest, 2.79 Mgal/d (February 2020). Higher pumpage tends to occur during fall and summer, causing water levels in the observation wells to decline; lower pumpage occurs during winter and spring, causing water levels to rise.

Water levels in the **Patuxent aquifer** range from 23.8 ft above sea level south of Ft. Meade (AA Cb 1) to 113.87 ft below sea level in the Arnold well field (AA Cf 166). Water-level trend remains relatively stable in the Dorsey Road well field (AA Ad 90). Water levels at Dorsey Road have fluctuated due to localized pumping. In the Crofton Meadows well field (AA Cc 102 and 135), water levels continue to decline. Recent pumpage in the Crofton Meadows well field ranged from the highest, 6.48 Mgal/d (September 2019) to the lowest, 2.66 Mgal/d (June 2020). In the Arnold well field (AA Cf 166—remote test well) water levels fluctuate by as much as 50 feet but show a relatively stable trend since about 2014. Recent pumpage in Arnold ranged from the highest, 3.96 Mgal/d (Jan 2020) to 3.59 Mgal/d (April 2020). Higher pumpage tends to occur during fall and summer, causing water levels in the observation wells to decline; lower pumpage occurs during winter and spring, causing water levels to rise.

The daily discharge in **Sawmill Creek** was above approximately 5 cubic feet per second over the past year (~July 2019 to June 2020).

GROUND-WATER MONITORING WELLS

<u>Well Number</u>	<u>Location</u>	<u>Aquifer</u>
AA Ad 90	Aviation Blvd., Glen Burnie	Patuxent
AA Ad 102	Aviation Blvd., Glen Burnie	Lower Patapsco
AA Ad 108	Aviation Blvd., Glen Burnie	Upper Patapsco
AA Ad 109	Dorsey Road, Glen Burnie	Lower Patapsco
AA Bc 215	Telegraph Road	Lower Patapsco
AA Bd 152	Woodside School, Glen Burnie	Lower Patapsco
AA Bd 155	State Highway Administration, Glen Burnie	Lower Patapsco
AA Bd 156	Baltimore-Annapolis Bike Trail, Glen Burnie	Lower Patapsco
AA Bd 157	Rippling Woods Elementary School, Glen Burnie	Lower Patapsco
AA Bd 158	Center for Applied Technology, Glen Burnie	Lower Patapsco
AA Bd 159	Rippling Woods ES, near Glen Burnie	Upper Patapsco
AA Bd 160	Queenstown Park, near Glen Burnie	Lower Patapsco
AA Cb 1	Patuxent Wildlife Refuge Center	Patuxent
AA Cc 82	King Heights Water-Treatment Plant	Lower Patapsco
AA Cc 89	Crofton Water-Treatment Plant	Lower Patapsco
AA Cc 102	Crofton Water-Treatment Plant	Patuxent
AA Cc 115	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Cc 116	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Cc 135	Crofton Meadows Water-Treatment Plant	Patuxent
AA Cc 137	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Ce 117	Severndale Water-Treatment Plant	Patuxent
AA Cf 99	Traffic Engineering Building, Broad Neck	Magothy
AA Cf 134	Amberly Water-Treatment Plant	Upper Patapsco
AA Cf 137	Arnold Water-Treatment Plant	Lower Patapsco
AA Cf 166	Arnold Water-Treatment Plant (remote site)	Patuxent
AA Cf 167	Arnold Water-Treatment Plant (remote site)	Lower Patapsco
AA Cg 22	Sandy Point State Park	Patuxent
AA Cg 23	Sandy Point State Park	Lower Patapsco
AA Cg 24	Sandy Point State Park	Upper Patapsco
AA Dd 42	Route 50 and Howard Grove Road	Magothy
AA De 1	City of Annapolis Water Works Building	Magothy
AA De 95	Broad Creek Water-Treatment Plant	Upper Patapsco
AA De 128	Central Avenue well field	Upper Patapsco
AA De 206	Broad Creek Water-Treatment Plant	Lower Patapsco
AA De 219	City of Annapolis	Upper Patapsco
AA De 232	City of Annapolis	Lower Patapsco
AA Df 19	U.S. Navy Radio Station	Upper Patapsco
AA Df 20	U.S. Navy Radio Station	Magothy
AA Df 79	U.S. Naval Academy	Magothy
AA Fe 92	Deale Athletic Field	Aquia
AA Fe 93	Deale Athletic Field	Magothy

SURFACE-WATER MONITORING GAGE

<u>Gage Number</u>	<u>Location</u>
01589500	Sawmill Creek

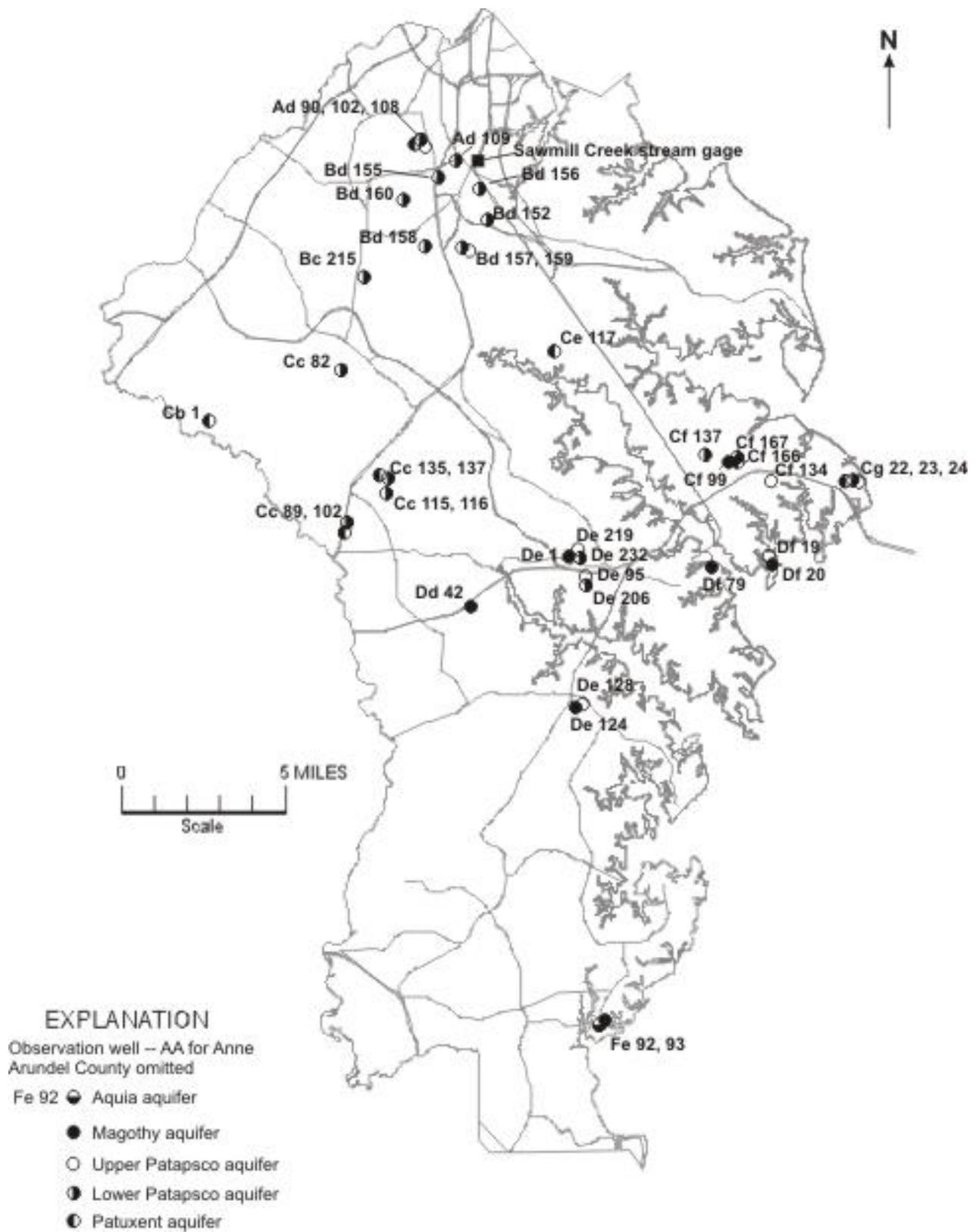


Figure 1. Location of observation wells and stream gage.

WELL NUMBER: AA Ad 90

PERMIT NUMBER: AA-04-0298

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39°10' 32", LONG. 76°38' 59"

AQUIFER: Patuxent Formation of Lower Cretaceous age

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 453 ft;

Casing diameter: 6 in. to 443 ft;

Screen diameter: 6 in. from 443 to 453 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 77.85 ft above NGVD of 1929.

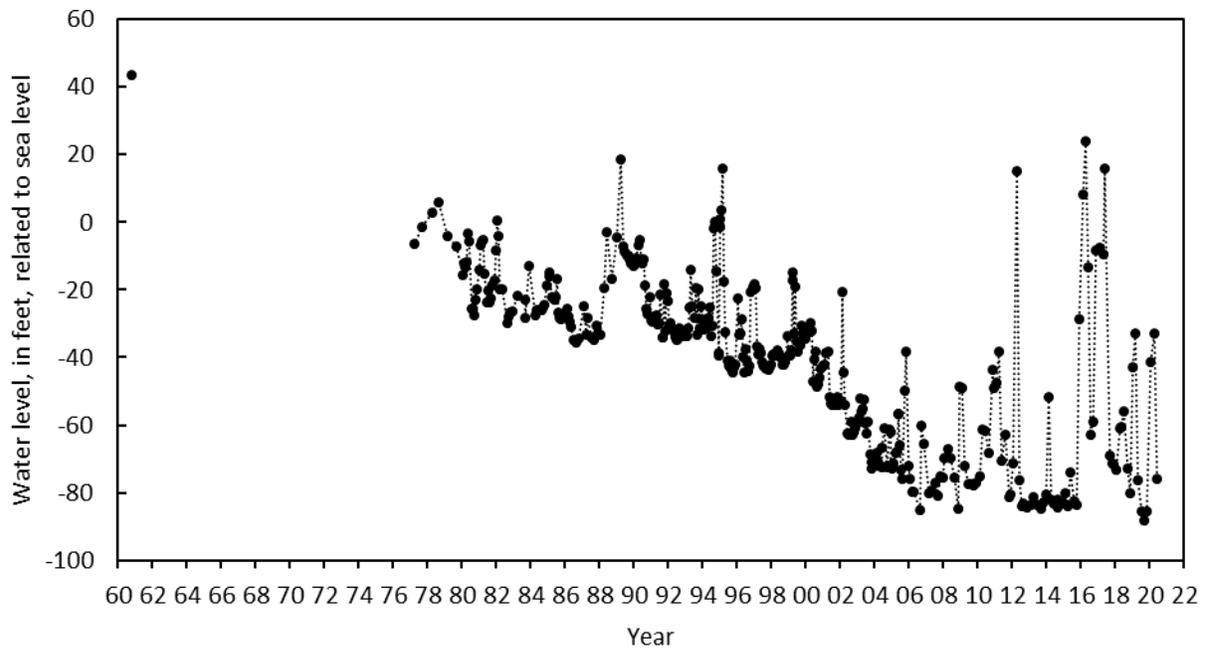
MEASURING POINT: Top of hole in flange 2.2 ft above land surface.

PERIOD OF RECORD: October 1960 to current year.

EXTREMES FOR RECORD: Highest water level measured, 34.4 ft below land surface, on October 8, 1960; lowest measured, 165.9 ft below land surface, on September 18, 2019.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	163.40	Nov 15, 2019	163.48	Apr 21, 2020	110.59
Sep 18, 2019	165.90	Jan 30, 2020	119.25	Jun 12, 2020	153.85



WELL NUMBER: AA Ad 102

PERMIT NUMBER: AA-81-2641

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39° 10' 32", LONG. 76° 38' 59"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 108 ft;

Casing diameter: 6 in. to 80 ft;

Screen diameter: 6 in. from 80 to 90 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 76.72 ft above NGVD of 1929.

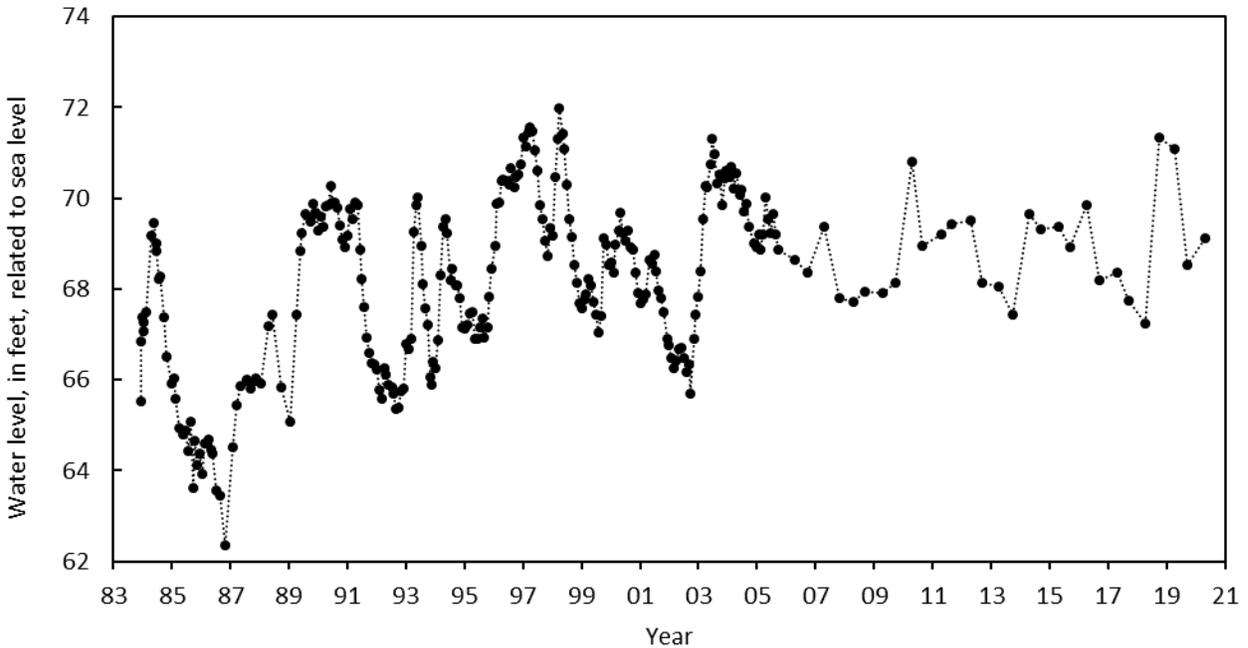
MEASURING POINT: Top of casing 5.27 ft above land surface.

PERIOD OF RECORD: December 1983 to current year.

EXTREMES FOR RECORD: Highest water level measured at 4.75 ft below land surface, on April 3, 1998; lowest measured at 14.36 ft below land surface, on November 3, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 18, 2019	8.19
Apr 21, 2020	7.61



WELL NUMBER: AA Ad 108

PERMIT NUMBER: AA-81-3475

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39°10' 32", LONG. 76°38' 59"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, water-table well, depth 11.5 ft;

Casing diameter: 4 in. to 6 ft;

Screen diameter: 4 in. from 6 to 11 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 78.31 ft above NGVD of 1929.

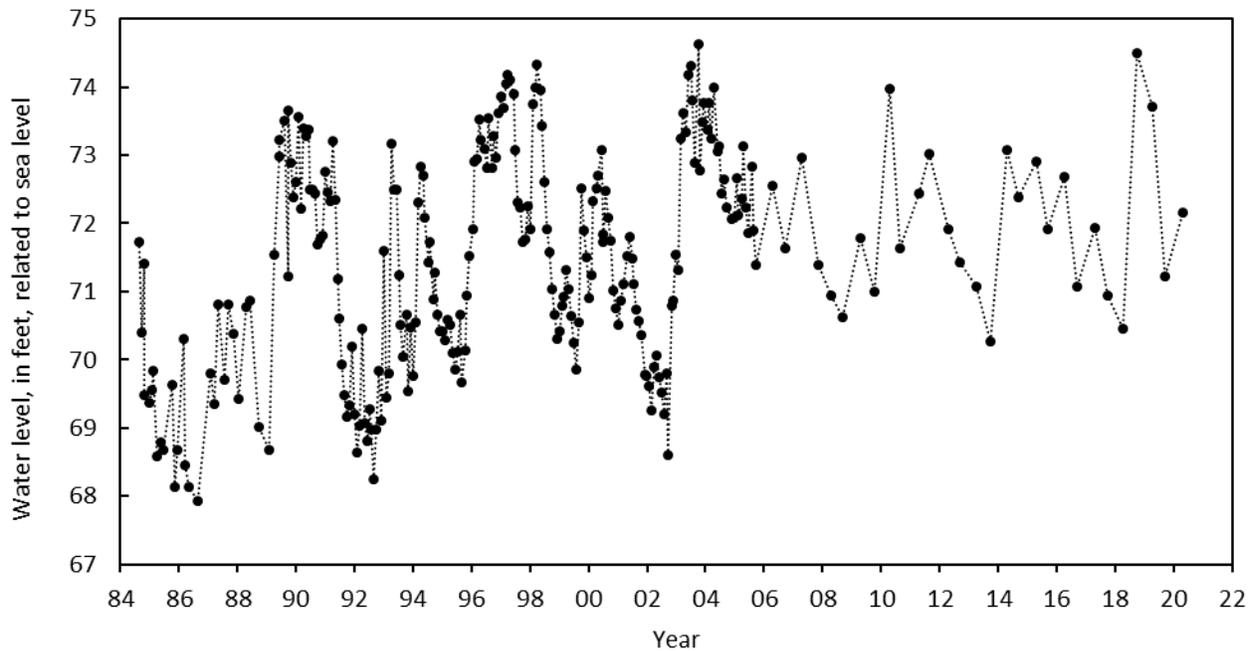
MEASURING POINT: Top of casing 5.5 ft above land surface.

PERIOD OF RECORD: August 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 3.68 ft below land surface, on August 22, 1985; lowest measured at 10.38 ft below land surface, on August 25, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 18, 2019	7.08
Apr 21, 2020	6.16



WELL NUMBER: AA Ad 109

PERMIT NUMBER: AA-81-4890

LOCATION: Dorsey Road, Glen Burnie

LAT. 39° 0' 06", LONG. 76° 38' 01"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 46 ft;

Casing diameter: 4 in. to 36 ft;

Screen diameter: 4 in. from 36 to 46 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 35.78 ft above NGVD of 1929.

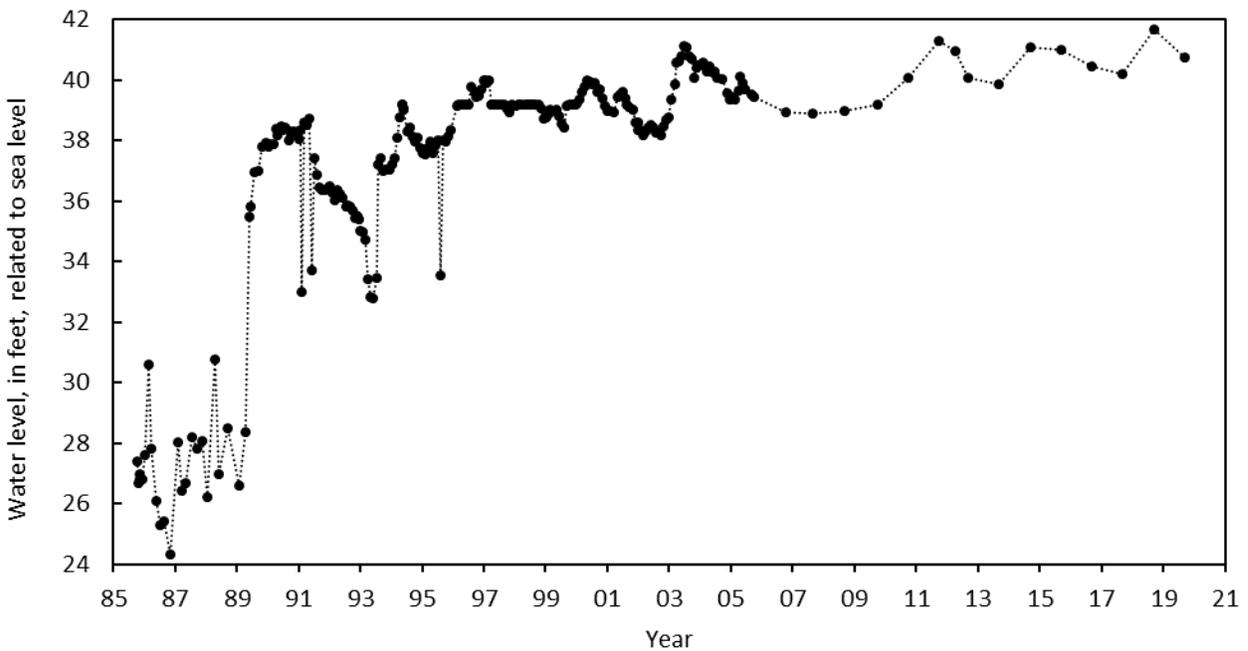
MEASURING POINT: Top of recorder platform 4.29 ft above land surface.

PERIOD OF RECORD: October 1985 to current year.

EXTREMES FOR RECORD: Highest water level measured at 5.90 ft above land surface, on September 6, 2018; lowest measured at 11.45 ft below land surface, on November 3, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM (READINGS ABOVE LAND-SURFACE INDICATED BY "-")

DATE	WATER LEVEL
Sep 10, 2019	-4.96



WELL NUMBER: AA Bc 215

PERMIT NUMBER: AA-81-1035

LOCATION: Telegraph Road

LAT. 39°07' 00", LONG. 76° 41' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, production, artesian well, depth 325 ft;

Casing diameter: 16 in. to 236 ft

Screen diameter: 10 in. from 235 to 239 ft, 250 to 284 ft, and 288 to 316 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 124 ft above NGVD of 1929.

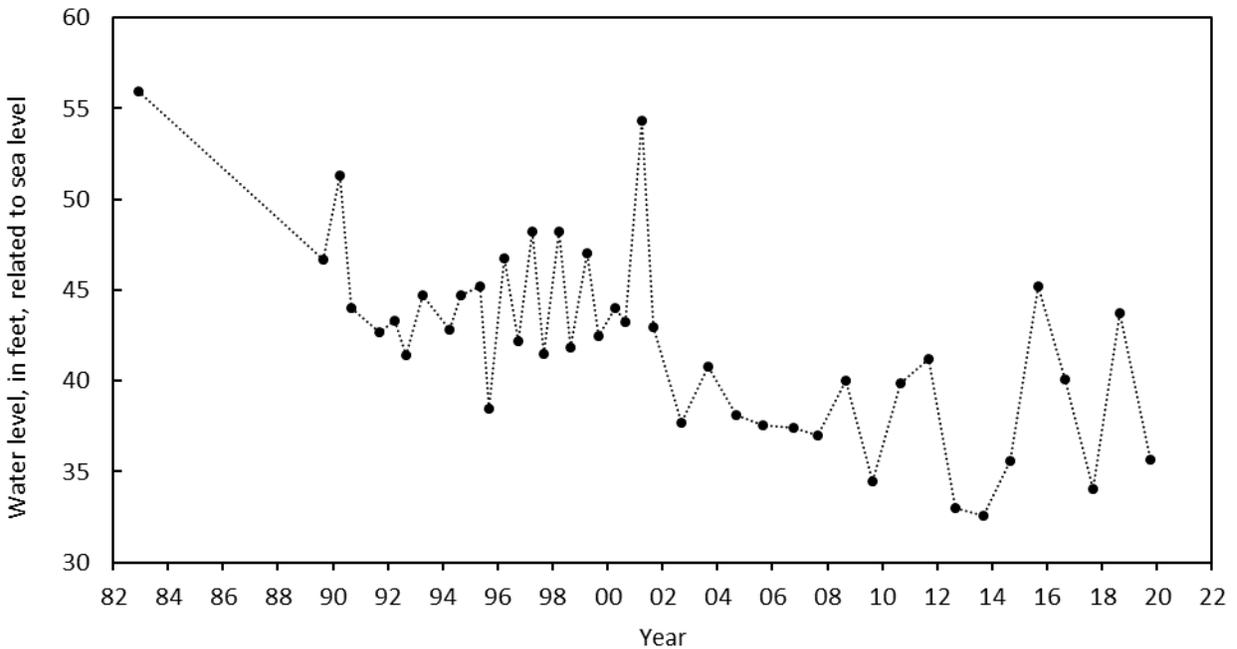
MEASURING POINT: Top of riser pipe 1 ft above land surface.

PERIOD OF RECORD: December 1982 to current year.

EXTREMES FOR RECORD: Highest water level measured at 68.03 ft below land surface, on September 6, 1982; lowest measured at 91.40 ft below land surface, on September 13, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Oct 01, 2019	88.37



WELL NUMBER: AA Bd 152

PERMIT NUMBER: AA-81-3463

LOCATION: Woodside School, Glen Burnie

LAT. 39° 08' 21", LONG. 76° 36' 54"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 103 ft;

Casing diameter: 6 in. to 90 ft;

Screen diameter: 4 in. from 90 to 100 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 53.29 ft above NGVD of 1929.

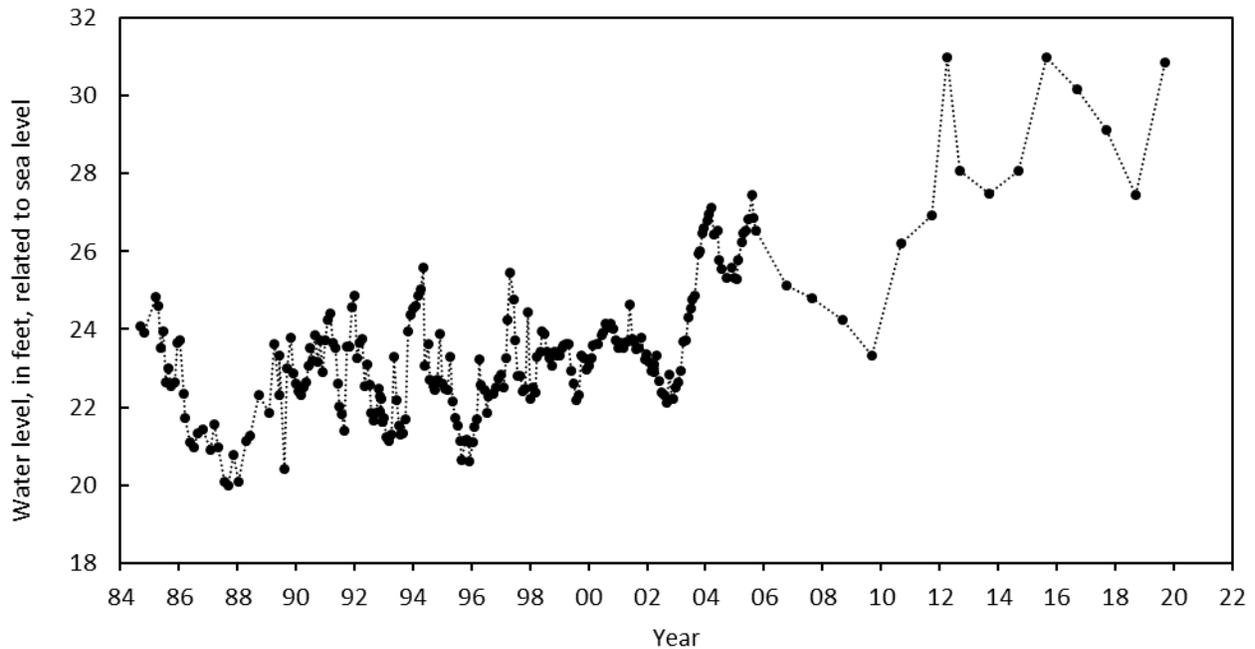
MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: September 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 22.29 ft below land surface, on April 9, 2012; lowest measured at 33.30 ft below land surface, on September 14, 1987.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 10, 2019	22.42



WELL NUMBER: AA Bd 155

PERMIT NUMBER: AA-81-3460

LOCATION: State Highway Administration, Glen Burnie

LAT. 39° 09' 38", LONG. 76° 38' 37"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 159 ft;

Casing diameter: 6 in. to 145 ft;

Screen diameter: 4 in. from 145 to 155 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 57.50 ft above NGVD of 1929.

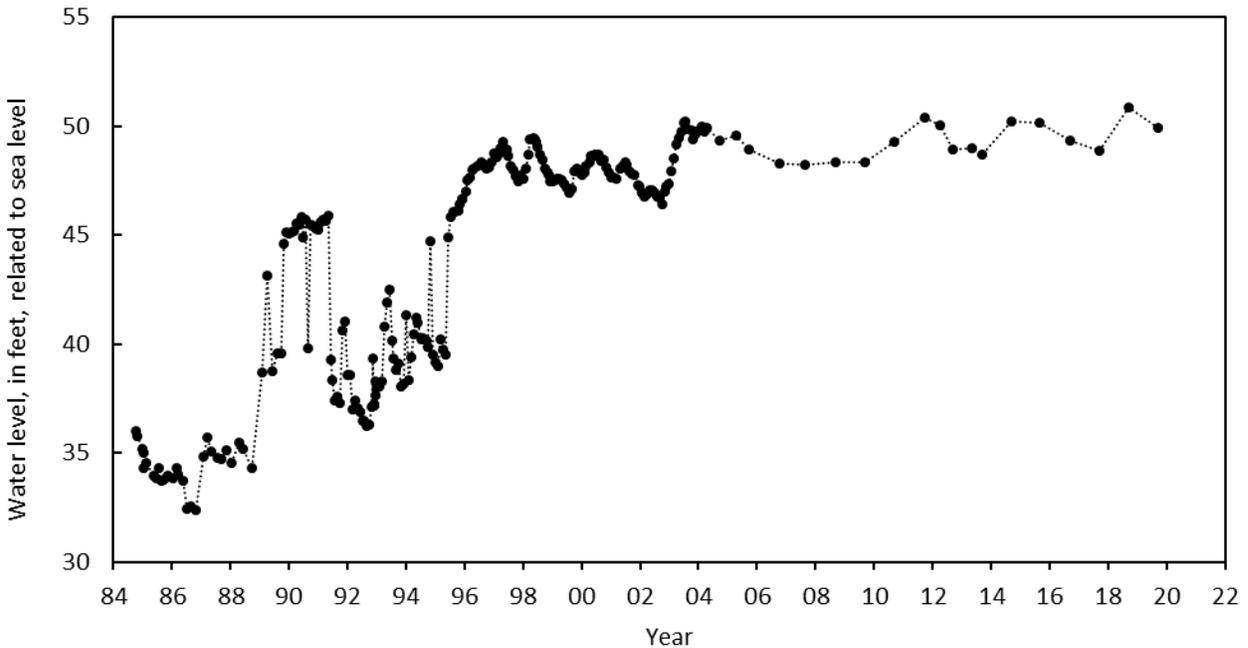
MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 6.62 ft below land surface, on September 6, 2018; lowest measured at 25.11 ft below land surface, on November 3, 1986.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 10, 2019	7.60



WELL NUMBER: AA Bd 156

PERMIT NUMBER: AA-81-3462

LOCATION: Baltimore-Annapolis Bike Trail, 0.3 mi. north
of Aquahart Rd., Glen Burnie

LAT. 39° 09' 22", LONG. 76° 37' 10"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 173 ft;

Casing diameter: 6 in. to 160 ft; 4 in. from 170 to 173 ft;

Screen diameter: 4 in. from 160 to 170 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 68.99 ft above NGVD of 1929.

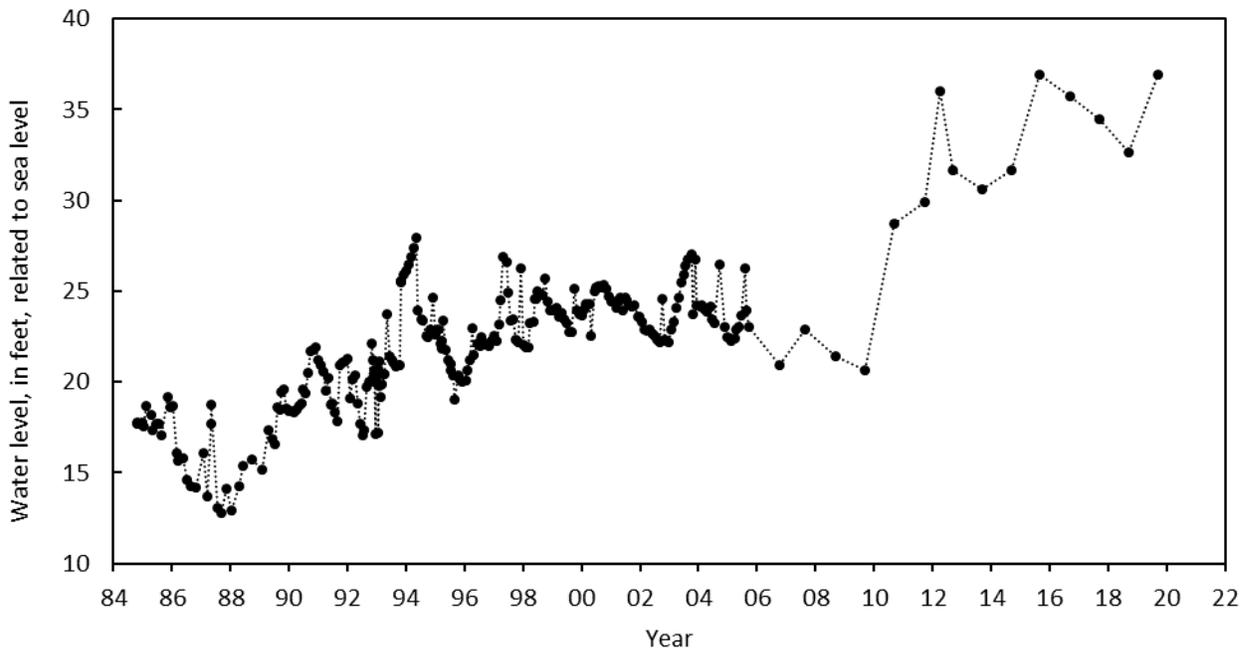
MEASURING POINT: Top of recorder platform 2.26 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 32.04 ft below land surface, on
September 10, 2019; lowest measured at 56.23 ft below land surface, on September 14, 1987.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 10, 2019	32.04



WELL NUMBER: AA Bd 157

PERMIT NUMBER: AA-81-3464

LOCATION: Rippling Woods Elementary School, Glen Burnie LAT. 39°07' 37", LONG. 76° 37' 44"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 180 ft;

Casing diameter: 6 in. to 167 ft;

Screen diameter: 4 in. from 167 to 177 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 75.75 ft above NGVD of 1929.

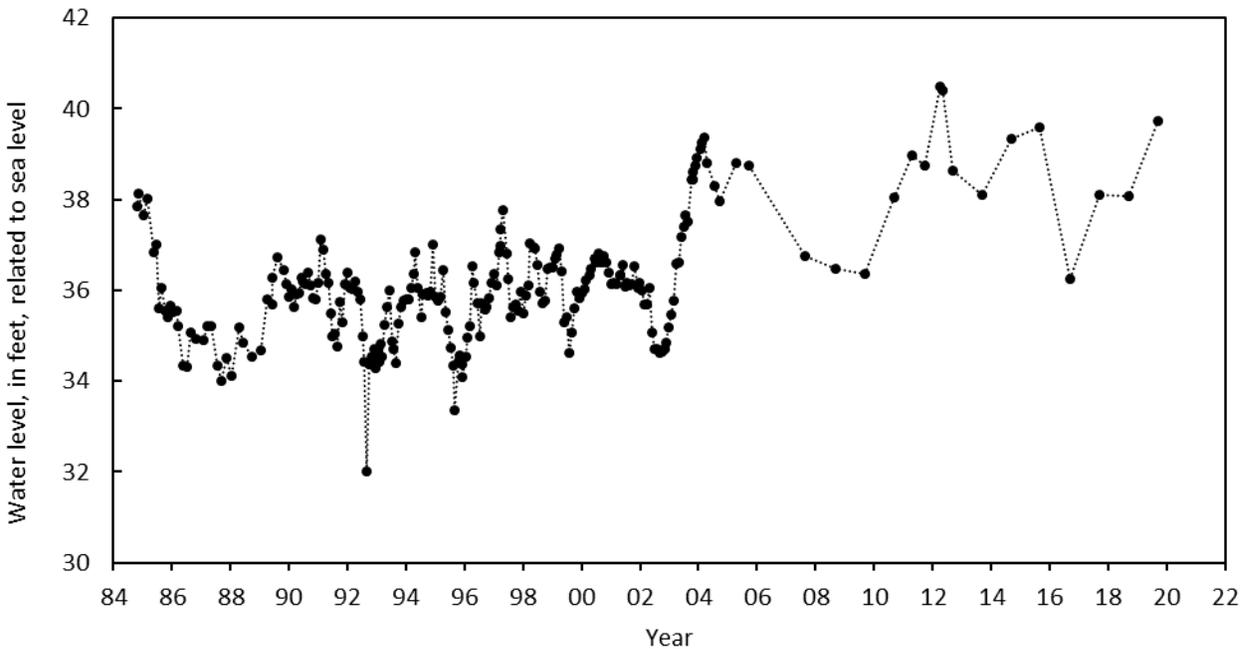
MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 35.25 ft below land surface, on April 19, 2012; lowest measured at 43.73 ft below land surface, on September 4, 1992.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 12, 2019	36.01



WELL NUMBER: AA Bd 158

PERMIT NUMBER: AA-81-3459

LOCATION: Center for Applied Technology, Glen Burnie

LAT. 39° 07' 44", LONG. 76° 37" 00"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 187 ft;

Casing diameter: 6 in. to 174 ft;

Screen diameter: 4 in. from 174 to 184 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 108.25 ft above NGVD of 1929.

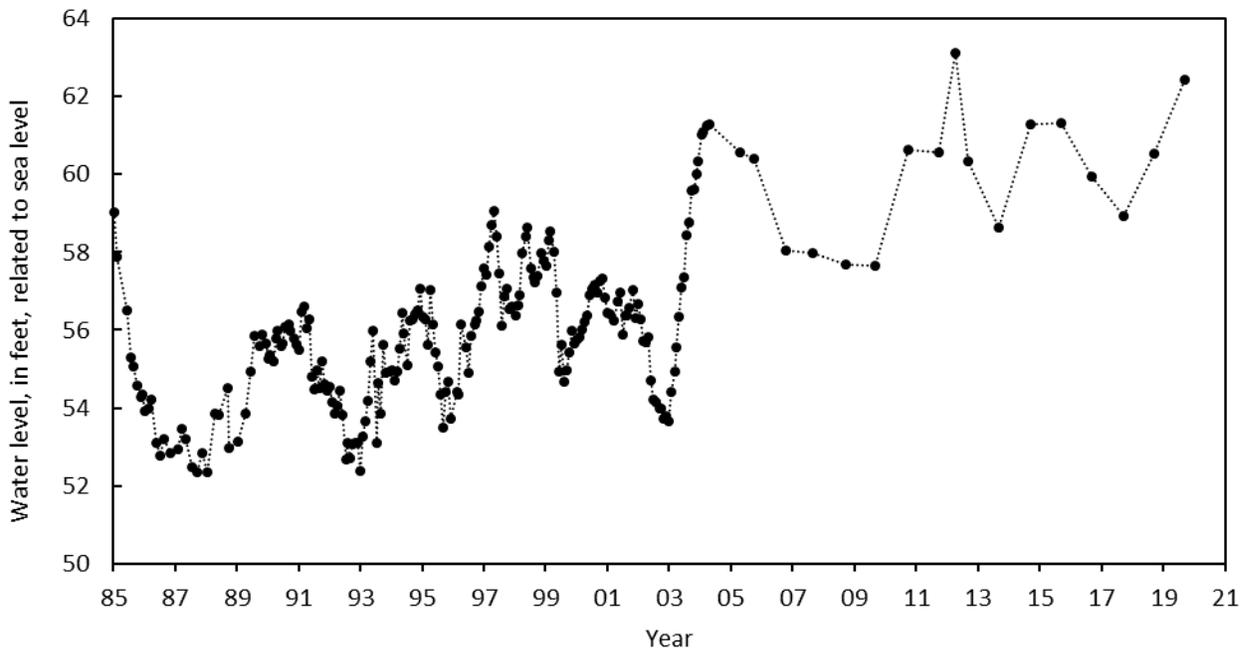
MEASURING POINT: Top of recorder platform 2.6 ft above land surface.

PERIOD OF RECORD: January 1985 to current year.

EXTREMES FOR RECORD: Highest water level measured at 45.12 ft below land surface, on April 9, 2012; lowest measured at 55.90 ft below land surface, on September 14, 1987.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 10, 2019	45.81



WELL NUMBER: AA Bd 159
LOCATION: Rippling Woods Elementary School,
near Glen Burnie

PERMIT NUMBER: AA-81-3949
LAT. 39°07' 37", LONG. 76°37' 44"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 100 ft;

Casing diameter: 6 in. to 89 ft;

Screen diameter: 4 in. from 89 to 99 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 75.48 ft above NGVD of 1929.

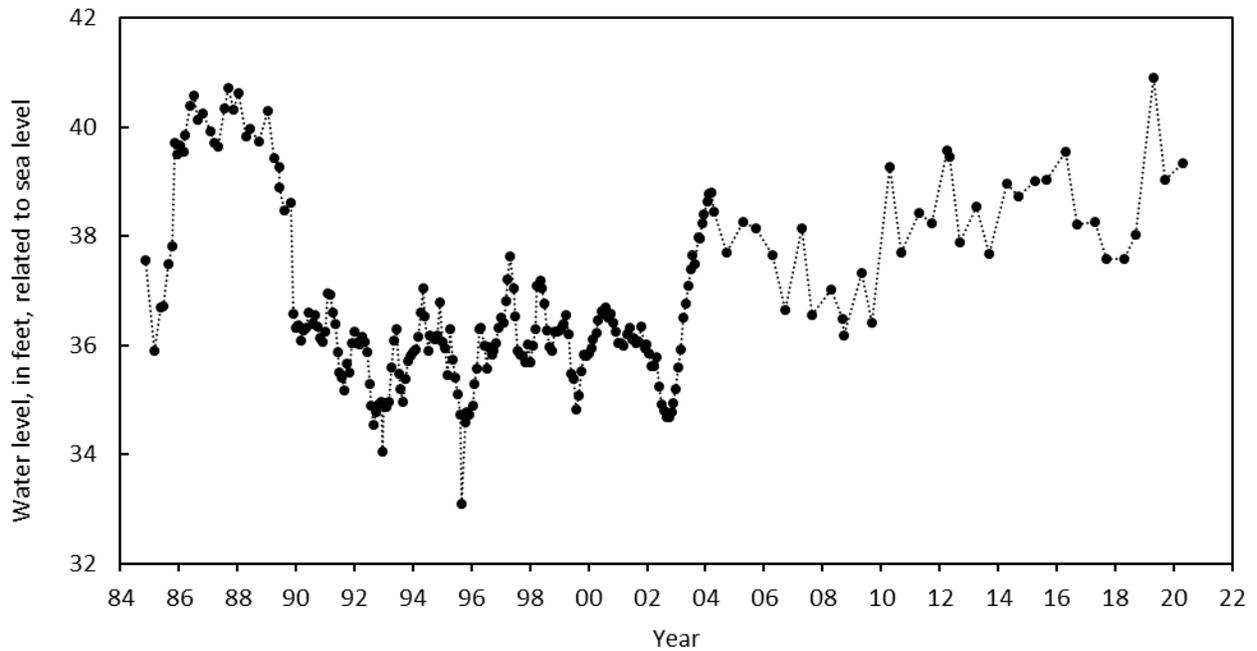
MEASURING POINT: Top of casing 2.5 ft above land surface.

PERIOD OF RECORD: November 1984 to current year.

EXTREMES FOR RECORD: Highest water level measured at 34.58 ft below land surface, on
April 26, 2019; lowest measured at 42.38 ft below land surface, on September 7, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 12, 2019	36.44
Apr 30, 2020	36.15



WELL NUMBER: AA Bd 160

PERMIT NUMBER: AA-81-3461

LOCATION: Queenstown Park, near Glen Burnie

LAT. 39° 09' 08", LONG. 76°39' 44"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 118 ft;

Casing diameter: 6 in. to 105 ft;

Screen diameter: 4 in. from 105 to 115 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 88 ft above NGVD of 1929.

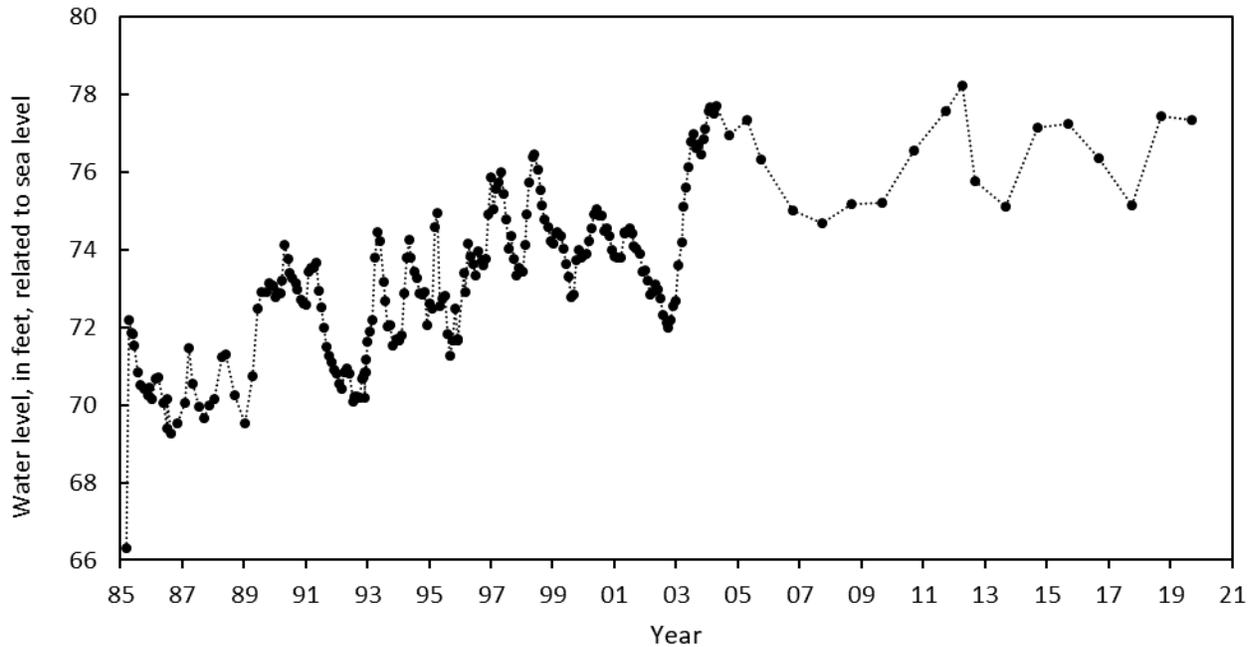
MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: March 1985 to current year.

EXTREMES FOR RECORD: Highest water level measured at 9.77 ft below land surface, on April 9, 2012; lowest measured at 21.7 ft below land surface, on March 20, 1985.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 10, 2019	10.67



WELL NUMBER: AA Cb 1

PERMIT NUMBER: AA-03-5695

LOCATION: Patuxent Wildlife Refuge Center

LAT. 39°03' 03", LONG. 76°46' 32"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 505 ft;

Casing diameter: 6 in. to 485 ft;

Screen diameter: 6 in. from 485 to 505 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 129.10 ft above NGVD of 1929.

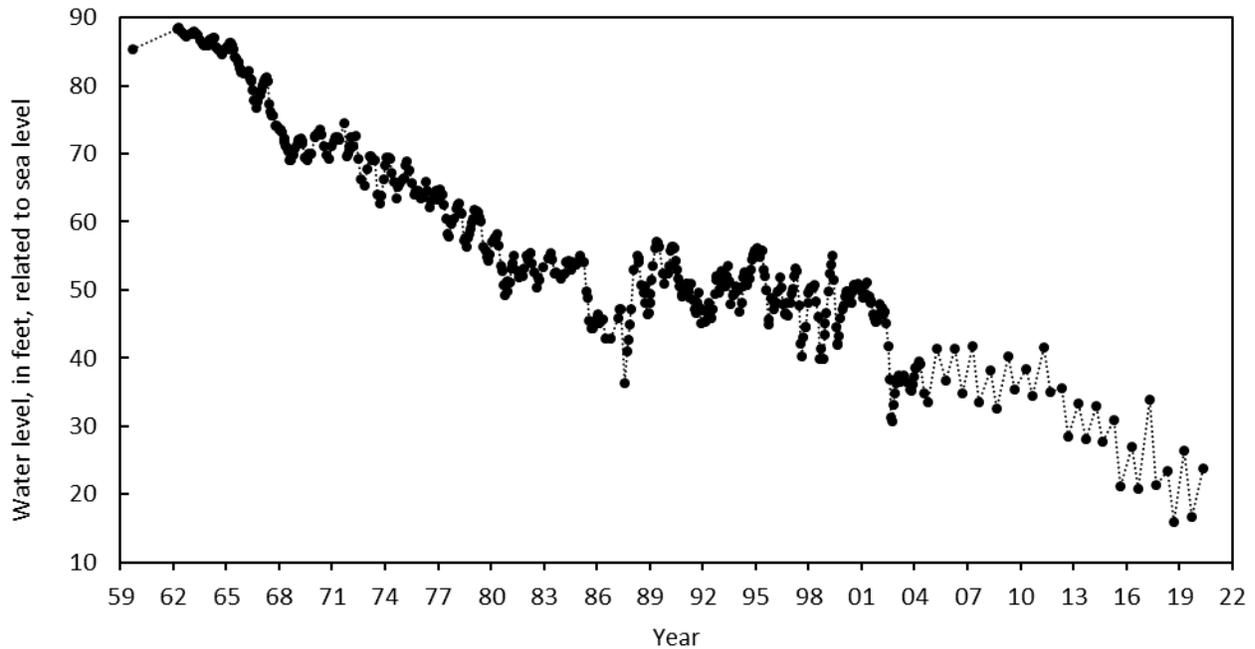
MEASURING POINT: Top of recorder platform 3.35 ft above land surface.

PERIOD OF RECORD: September 1959 to current year.

EXTREMES FOR RECORD: Highest water level measured at 40.6 ft below land surface, on May 1, 1962; lowest measured at 113.22 ft below land surface, on September 6, 2018.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 13, 2019	112.40
Apr 30, 2020	105.30



WELL NUMBER: AA Cc 82

PERMIT NUMBER: AA-04-6965

LOCATION: King Heights Water-Treatment Plant

LAT. 39° 04' 22", LONG. 76° 41' 45"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 458 ft;

Casing diameter: 1 in. to 455 ft;

Screen diameter: 1.25 in. from 455 to 458 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 177.96 ft above NGVD of 1929.

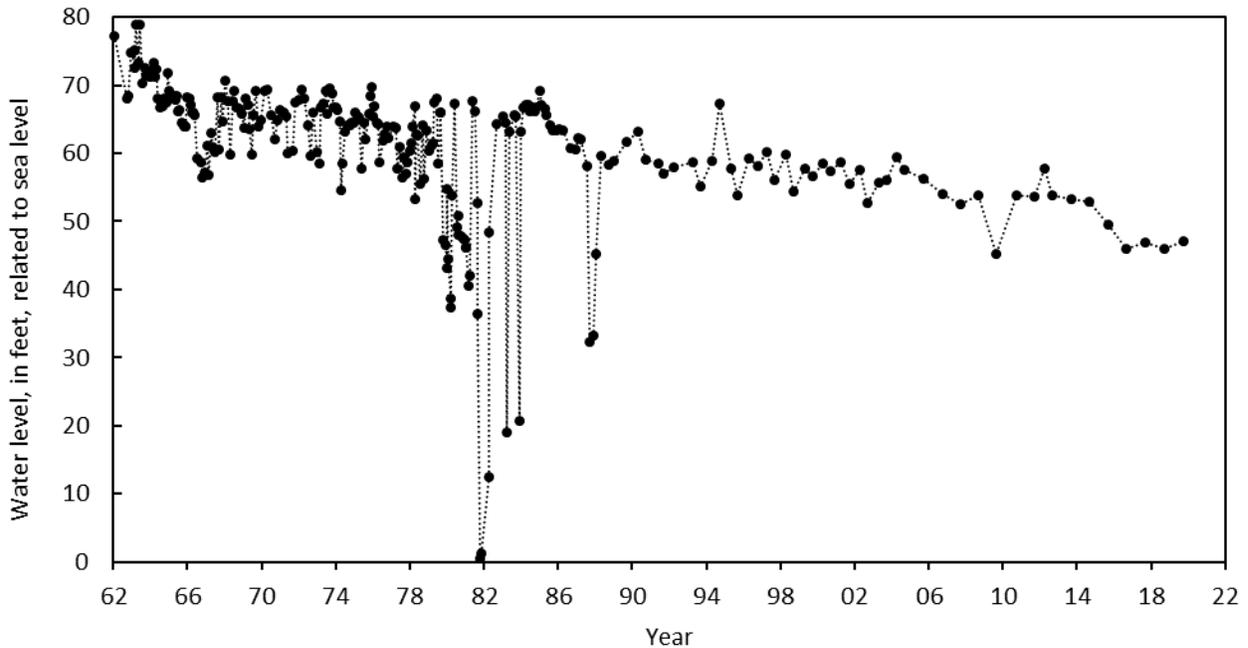
MEASURING POINT: Top of casing 0.5 ft above land surface.

PERIOD OF RECORD: January 1962 to current year.

EXTREMES FOR RECORD: Highest water level measured at 99.08 ft below land surface, on June 4, 1963; lowest measured at 177.45 ft below land surface, on October 9, 1981.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Oct 04, 2019	130.89



WELL NUMBER: AA Cc 89

PERMIT NUMBER: AA-65-0672

LOCATION: Crofton Water-Treatment Plant

LAT. 39° 00' 10", LONG. 76° 41' 57"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 605 ft;

Casing diameter: 4 in. to 575 ft;

Screen diameter: 4 in. from 575 to 605 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 52.77 ft above NGVD of 1929.

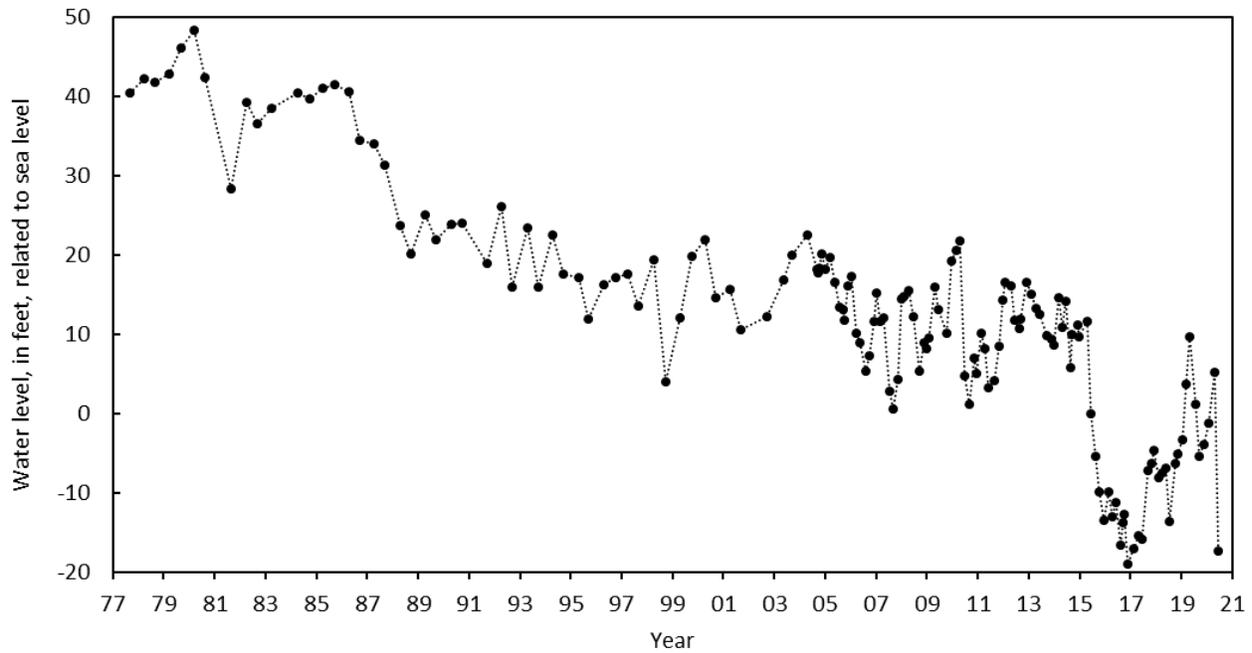
MEASURING POINT: Top of recorder platform 3.6 ft above land surface.

PERIOD OF RECORD: September 1977 to current year.

EXTREMES FOR RECORD: Highest water level measured at 4.45 ft below land surface, on March 12, 1980; lowest measured at 71.85 ft below land surface, on November 16, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	51.66	Nov 15, 2019	56.64	Apr 21, 2020	47.56
Sep 18, 2019	58.19	Jan 30, 2020	54.03	Jun 12, 2020	70.13



WELL NUMBER: AA Cc 102

LOCATION: Crofton Water-Treatment Plant

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 960 ft;

Casing diameter: 4 in. to 850 ft;

Screen diameter: 4 in. from 850 to 960 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 53.96 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.3 ft above land surface.

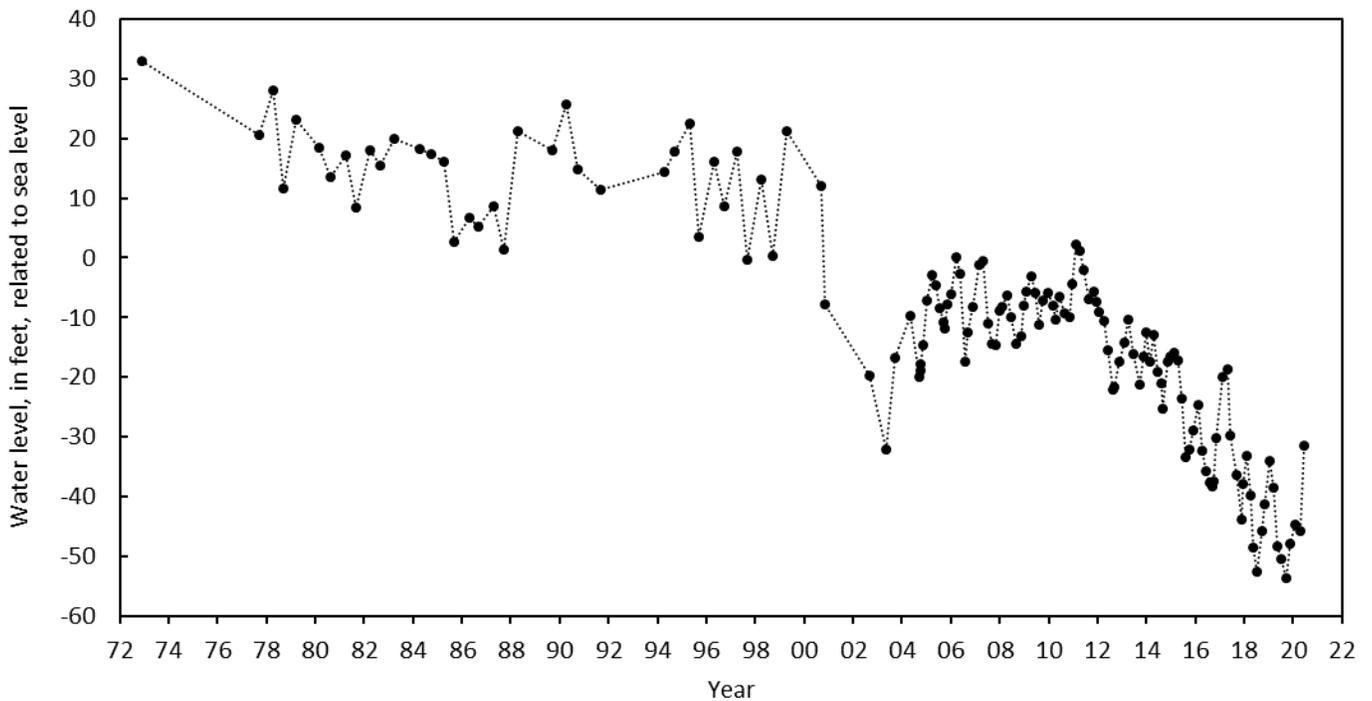
PERIOD OF RECORD: December 1972 to current year.

EXTREMES FOR RECORD: Highest water level measured at 21 ft below land surface, on

December 1, 1972; lowest measured at 107.65 ft below land surface, on September 18, 2019.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	104.53	Nov 15, 2019	101.94	Apr 21, 2020	99.80
Sep 18, 2019	107.65	Jan 30, 2020	98.79	Jun 12, 2020	85.44



WELL NUMBER: AA Cc 115

PERMIT NUMBER: AA-73-9755

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 03", LONG. 76° 40' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 671 ft;

Casing diameter: 4 in. to 661 ft;

Screen diameter: 4 in. from 661 to 671 ft;

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 134.38 ft above NGVD of 1929.

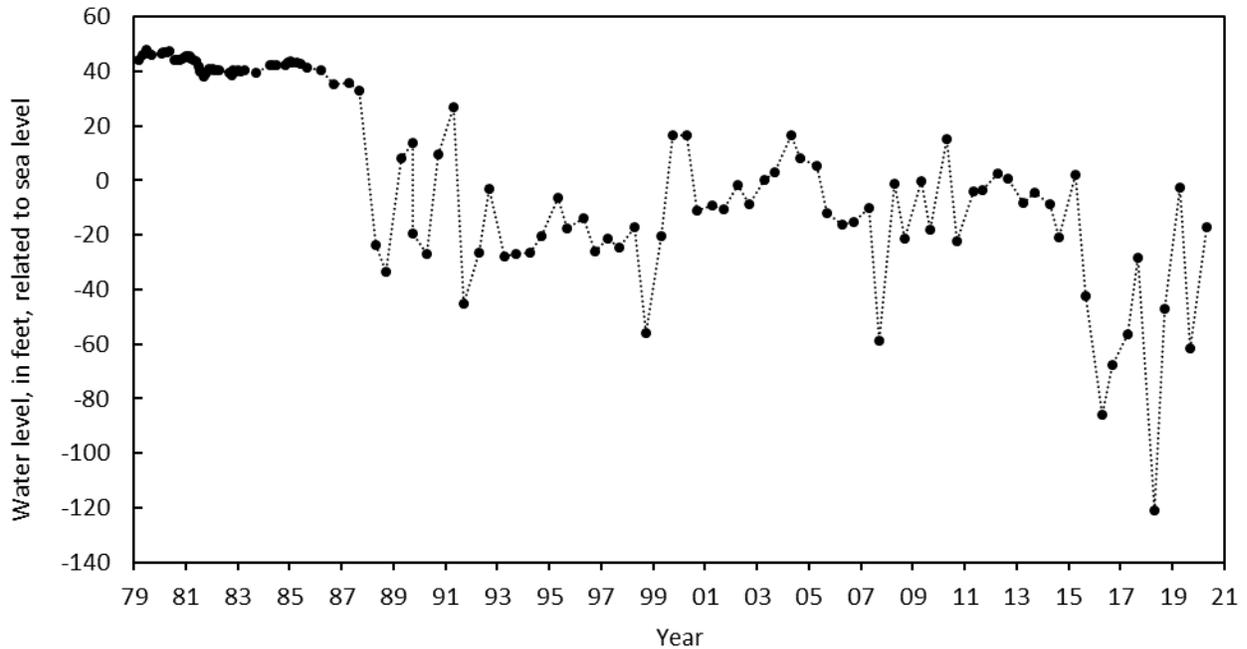
MEASURING POINT: Top of recorder platform 3.55 ft above land surface.

PERIOD OF RECORD: March 1979 to current year.

EXTREMES FOR RECORD: Highest water level measured at 86.26 ft below land surface, on June 28, 1979; lowest measured at 255.41 ft below land surface, on April 23, 2018.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 16, 2019	196.15
Apr 30, 2020	151.41



WELL NUMBER: AA Cc 116

PERMIT NUMBER: AA-73-9756

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 03", LONG. 76° 40' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 483 ft;

Casing diameter: 4 in. to 473 ft;

Screen diameter: 4 in. from 473 to 483 ft;

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 134.35 ft above NGVD of 1929.

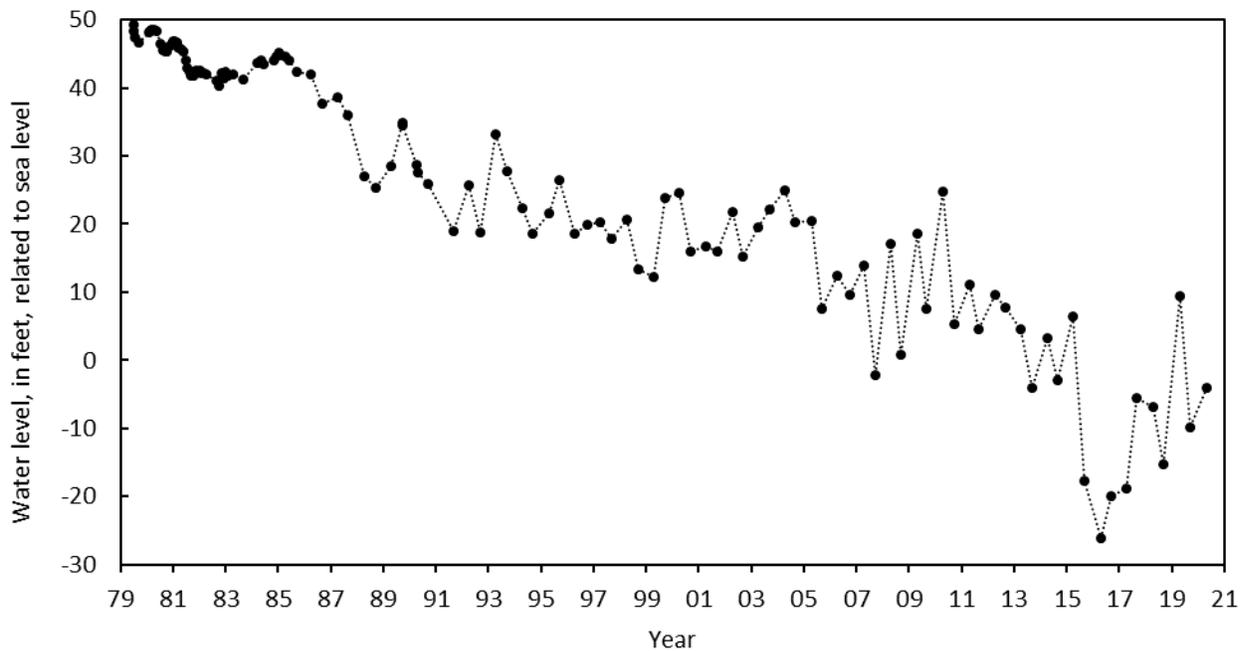
MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: June 1979 to current year.

EXTREMES FOR RECORD: Highest water level measured at 85.04 ft below land surface, on June 28, 1979; lowest measured at 160.55 ft below land surface, on April 15, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 16, 2019	144.18
Apr 30, 2020	138.32



WELL NUMBER: AA Cc 135

PERMIT NUMBER: AA-93-0998

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 26", LONG. 76° 40' 30"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,100 ft.

Casing diameter: 4 in. to 299 ft; 2 in. from 299 to 985 ft, and 1,035 to 1,070 ft;

Screen diameter: 2 in. from 985 to 1,035 ft, and 1,070 to 1,100 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 114.81 ft above NGVD of 1929.

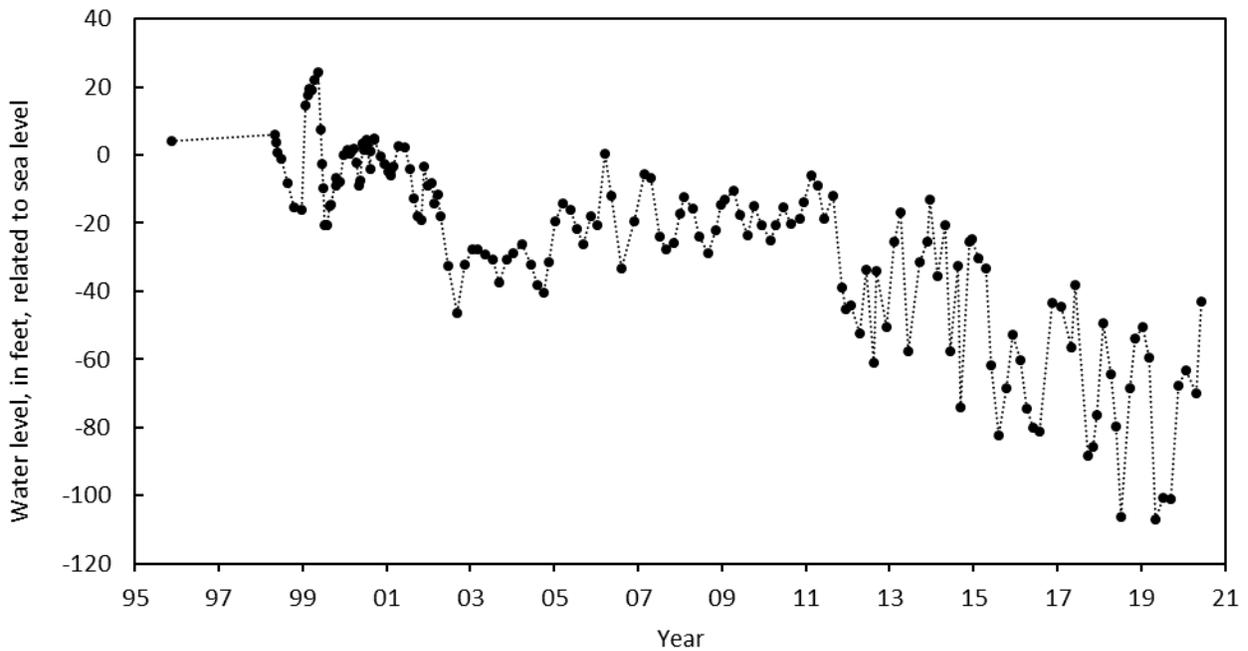
MEASURING POINT: Top of 6-inch steel flange 3.48 ft above land surface.

PERIOD OF RECORD: November 1995 to current year.

EXTREMES FOR RECORD: Highest water level measured at 90.42 ft below land surface, on May 19, 1999; lowest measured at 221.88 ft below land surface, on May 2, 2019.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	215.33	Nov 15, 2019	182.63	Apr 21, 2020	184.65
Sep 18, 2019	215.98	Jan 30, 2020	178.01	Jun 12, 2020	157.74



WELL NUMBER: AA Cc 137

PERMIT NUMBER: AA-93-0993

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 26", LONG. 76° 40' 29"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 690 ft.

Casing diameter: 4 in. to 300 ft; 2 in. from 300 to 476 ft, 506 to 536 ft, and 576 to 606 ft;

Screen diameter: 2 in. from 476 to 506 ft, 536 to 576 ft, and 606 to 686 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 115.34 ft above NGVD of 1929.

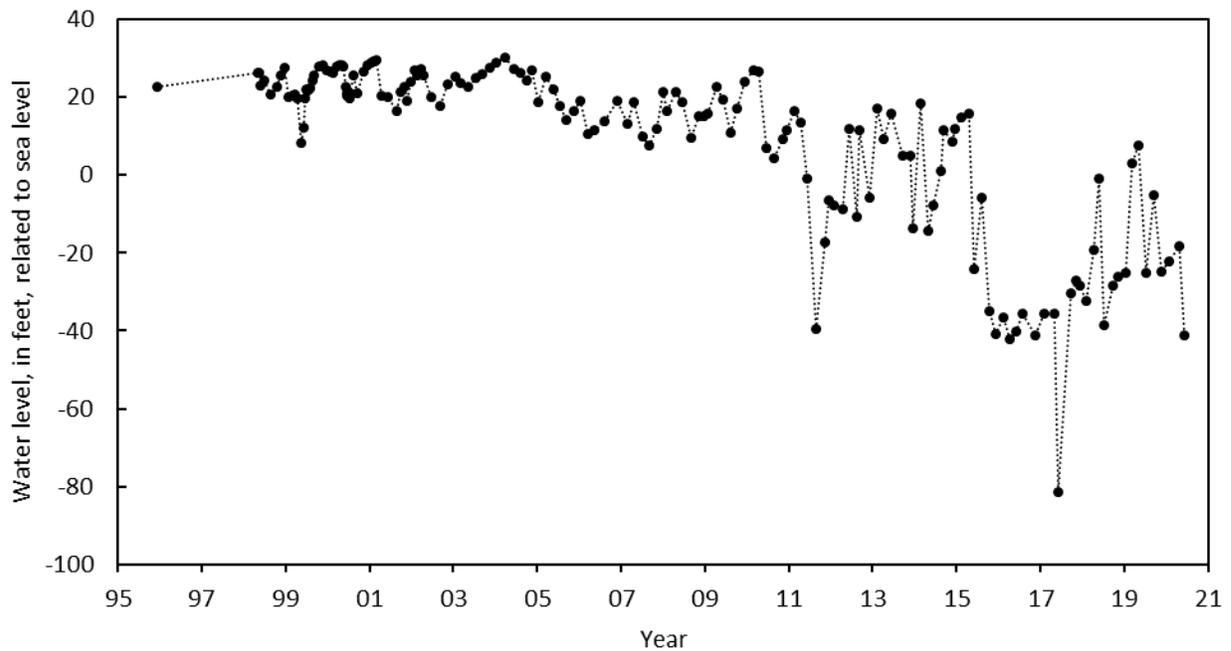
MEASURING POINT: Top of 4-inch PVC casing 2.2 ft above land surface.

PERIOD OF RECORD: December 1995 to current year.

EXTREMES FOR RECORD: Highest water level measured at 85.28 ft below land surface, on March 30, 2004; lowest measured at 196.93 ft below land surface, on June 5, 2017.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	140.90	Nov 15, 2019	140.03	Apr 21, 2020	133.48
Sep 18, 2019	120.56	Jan 30, 2020	137.61	Jun 12, 2020	156.46



WELL NUMBER: AA Ce 117

PERMIT NUMBER: AA-73-0172

LOCATION: Severndale Water-Treatment Plant

LAT. 39° 04' 50", LONG. 76° 34' 34"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 922 ft;

Casing diameter: 6 in. to 836 ft, 851 to 870 ft, and 890 to 907 ft;

Screen diameter: 6 in. from 836 to 851 ft, 870 to 890 ft, and 907 to 922 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 86.0 ft above NGVD of 1929.

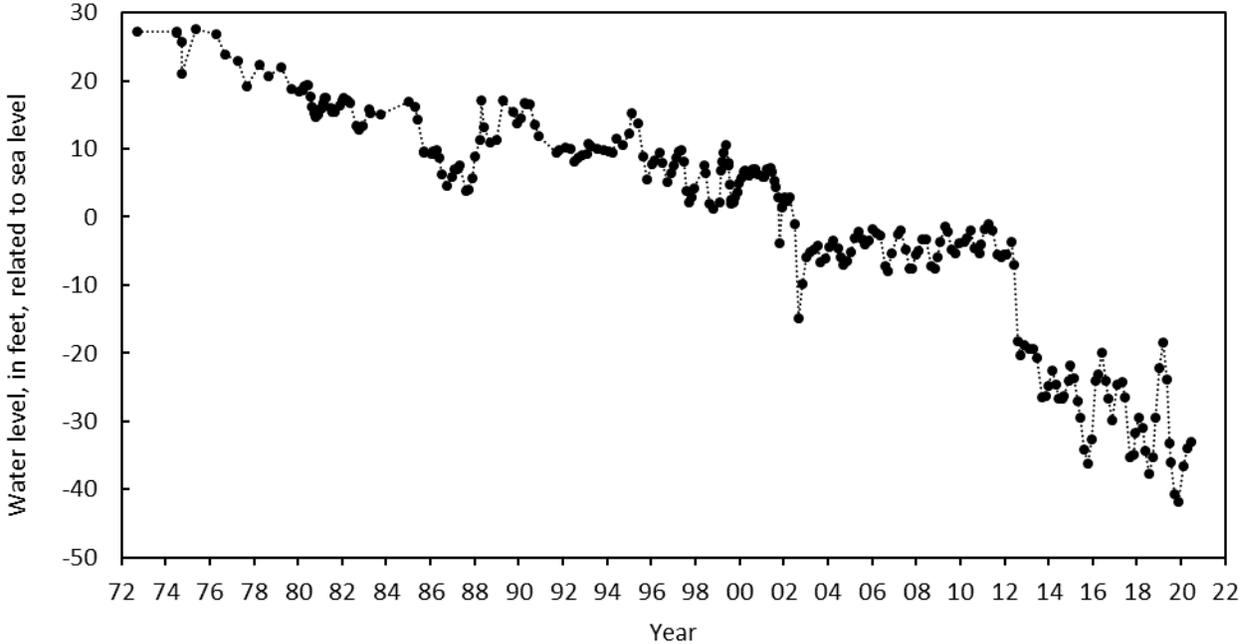
MEASURING POINT: Top of recorder platform 0.5 ft above land surface.

PERIOD OF RECORD: September 1972 to current year.

EXTREMES FOR RECORD: Highest water level measured at 58.48 ft below land surface, on May 15, 1975; lowest measured at 127.84 ft below land surface, on November 15, 2019.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jun 13, 2019	119.27	Sep 18, 2019	126.76	Jan 30, 2020	122.66
Jul 15, 2019	122.03	Nov 15, 2019	127.84	Apr 21, 2020	119.99
				Jun 12, 2020	119.01



WELL NUMBER: AA Cf 99

PERMIT NUMBER: AA-70-0199

LOCATION: Traffic Engineering Building, Broad Neck

LAT. 39° 01' 50", LONG. 76°28' 30"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 220 ft.

Casing diameter: 2 in. to 210 ft.

Screen diameter: 2 in. from 210 to 220 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 93.70 ft above NGVD of 1929.

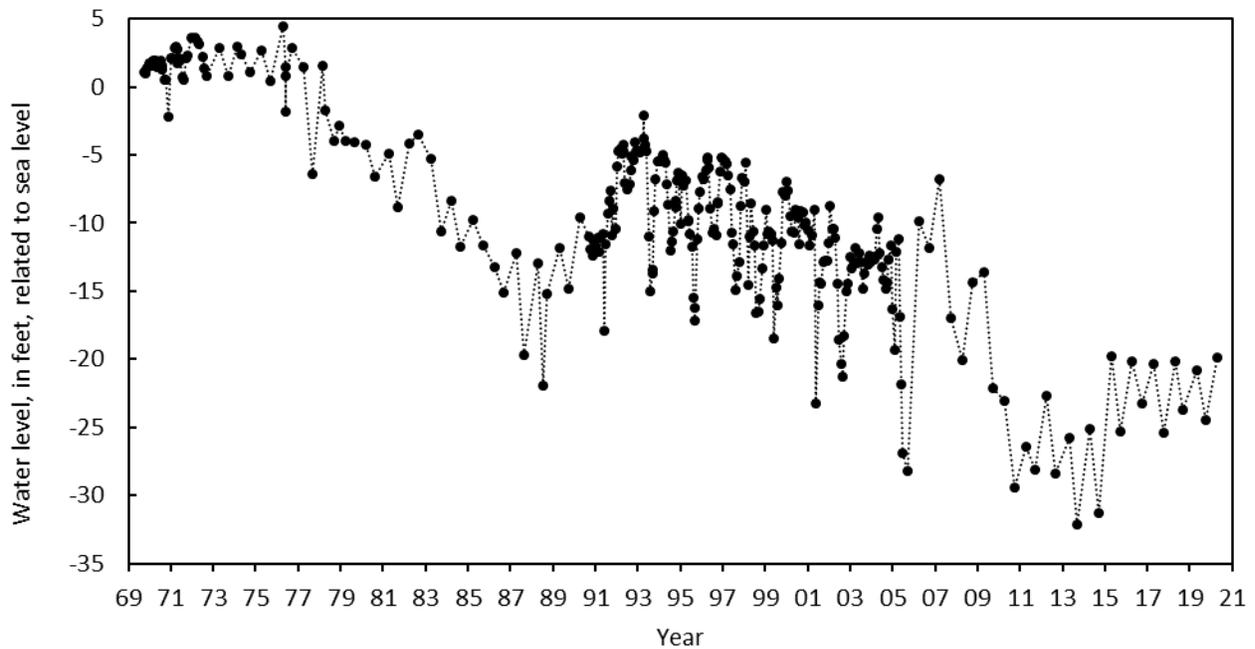
MEASURING POINT: Top of casing 3.60 ft above land surface.

PERIOD OF RECORD: September 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 89.29 ft below land surface, on April 13, 1976; lowest measured at 125.88 ft below land surface, on September 20, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 23, 2019	118.14
Apr 21, 2020	113.63



WELL NUMBER: AA Cf 134

PERMIT NUMBER: AA-70-0171

LOCATION: Amberly Water-Treatment Plant

LAT. 39° 01' 21", LONG. 76° 27' 05"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 590 ft.

Casing diameter: 24 in. to 370 ft; 16 in. from 270 to 360 ft, 363 to 370 ft, 392 to 455 ft, 495 to 502 ft, 528 to 542 ft, 560 to 566 ft, and 580 to 590 ft.

Screen diameter: 16 in. from 360 to 363 ft, 370 to 392 ft, 455 to 495 ft, 502 to 528 ft, 542 to 560 ft, and 566 to 580 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 24 ft above NGVD of 1929.

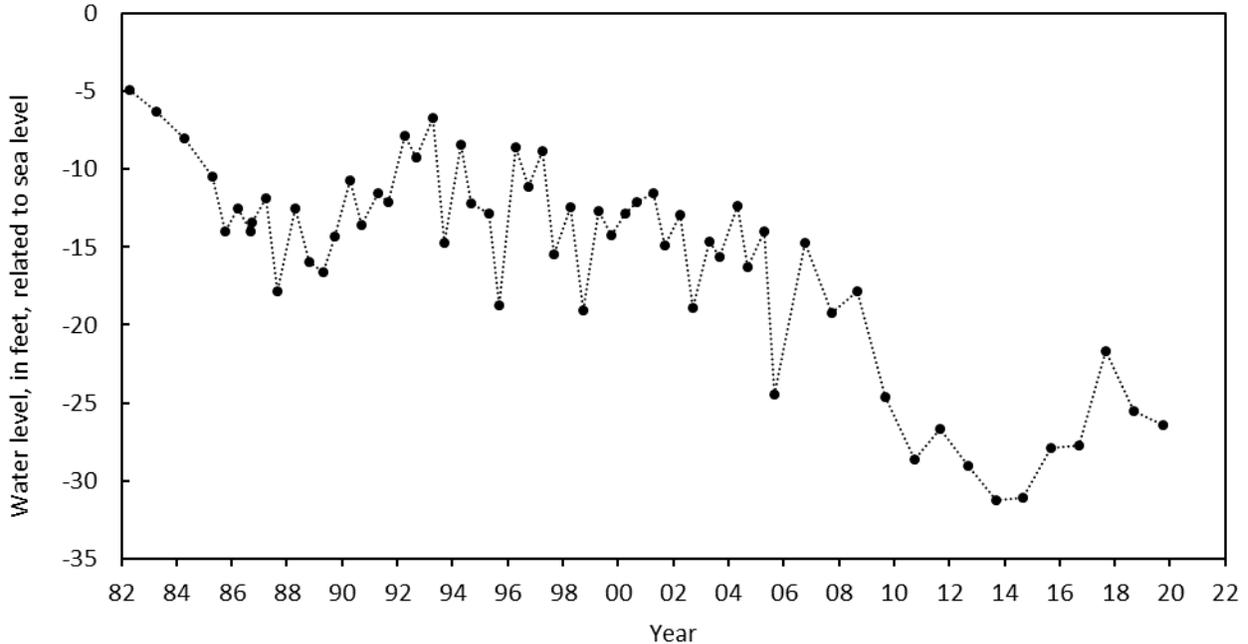
MEASURING POINT: Top of riser pipe 1.45 ft above land surface.

PERIOD OF RECORD: April 1982 to current year.

EXTREMES FOR RECORD: Highest water level measured at 28.88 ft below land surface, on April 14, 1982; lowest measured at 55.27 ft below land surface, on September 12, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 25, 2019	50.40



WELL NUMBER: AA Cf 137

PERMIT NUMBER: AA-86-0401

LOCATION: Arnold Water-Treatment Plant

LAT. 39°02' 05", LONG. 76°29' 27"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,030 ft.

Casing diameter: 6 in. to 543 ft, 4 in. from 543 to 791 ft, 816 to 826 ft, 856 to 876 ft, 896 to 916 ft, and 966 to 976 ft.

Screen diameter: 4 in. from 791 to 816 ft, 826 to 856 ft, 876 to 896 ft, and 916 to 966 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 124.3 ft above NGVD of 1929.

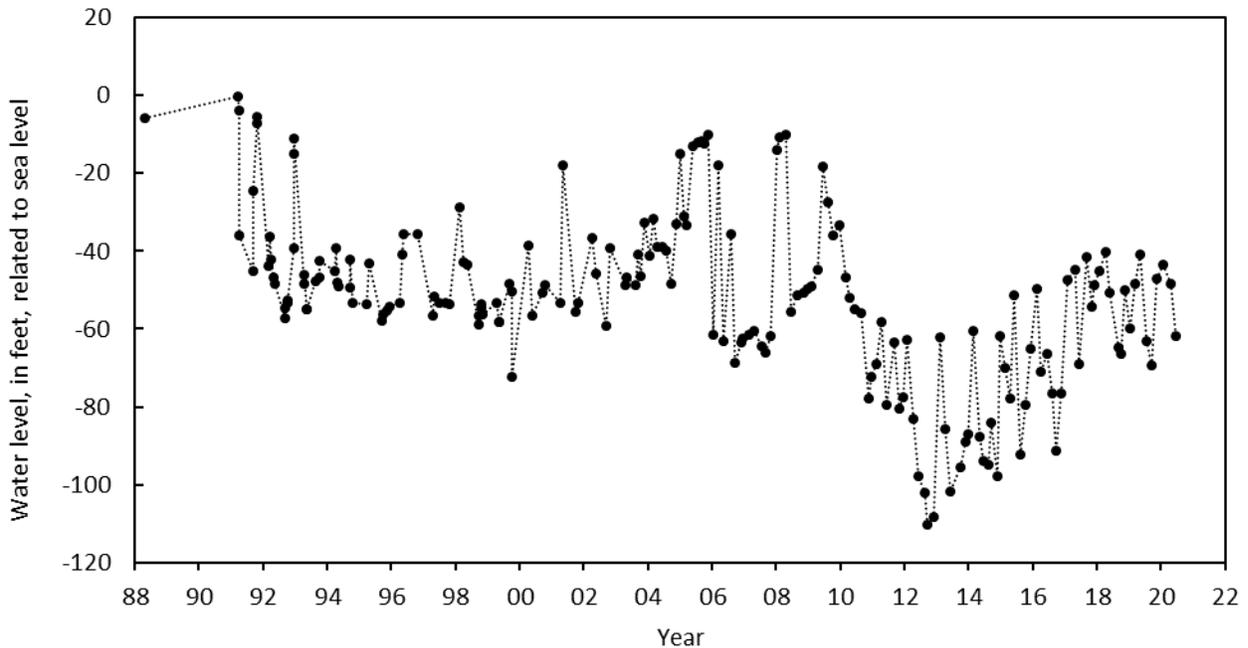
MEASURING POINT: Top of recorder platform 0.5 ft above land surface.

PERIOD OF RECORD: April 1988 to current year.

EXTREMES FOR RECORD: Highest water level measured at 124.54 ft below land surface, on March 22, 1991; lowest measured at 234.61 ft below land surface, on September 17, 2012.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	187.38	Nov 11, 2019	171.26	Apr 21, 2020	172.84
Sep 18, 2019	193.51	Jan 30, 2020	167.70	Jun 12, 2020	185.98



WELL NUMBER: AA Cf 166

PERMIT NUMBER: AA-95-3107

LOCATION: Arnold Water-Treatment Plant

LAT. 39° 01' 54", LONG. 76° 28' 29"

AQUIFER: Patuxent aquifer in the Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,535 ft.

Casing diameter: 6 in. to 420 ft, 4 in. from 420 to 1,320 ft, 1,340 to 1,360 ft, and 1,400 to 1,500 ft.

Screen diameter: 4 in. from 1,320 to 1,340 ft, 1,360 to 1,400 ft, and 1,500 to 1,530 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 105.93 ft above NGVD of 1929.

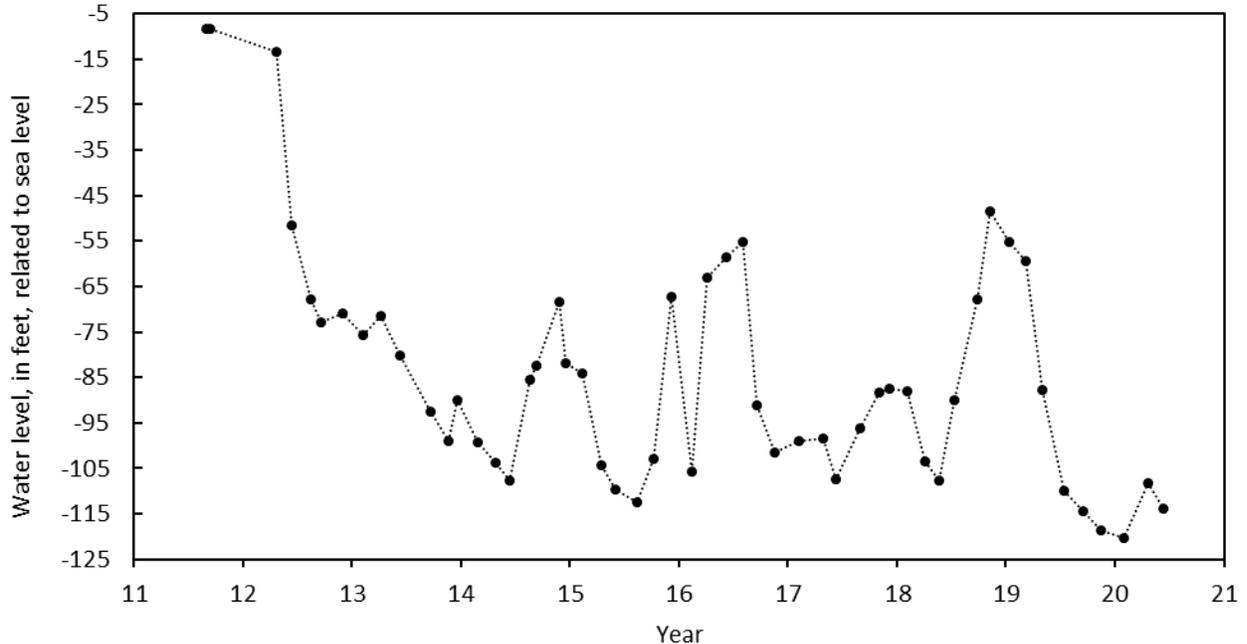
MEASURING POINT: Top of access cover at land surface.

PERIOD OF RECORD: August 2011 to current year.

EXTREMES FOR RECORD: Highest water level measured at 114.15 ft below land surface, on August 30, 2011; lowest measured at 226.31 ft below land surface, on January 30, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	215.74	Nov 15, 2019	224.52	Apr 23, 2020	214.28
Sep 18, 2019	220.40	Jan 30, 2020	226.31	Jun 12, 2020	219.80



WELL NUMBER: AA Cf 167

PERMIT NUMBER: AA-95-3108

LOCATION: Arnold Water-Treatment Plant

LAT. 39° 01' 54", LONG. 76°28' 29"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,505 ft.

Casing diameter: 6 in. to 420 ft, 4 in. from 420 to 750 ft, 775 to 815 ft, 840 to 855 ft, 865 to 880 ft, 890 to 915 ft, 925 to 935 ft, 945 to 960 ft, and 1,000 to 1,032 ft.

Screen diameter: 4 in. from 750 to 775 ft, 815 to 840 ft, 855 to 865 ft, 880 to 890 ft, 915 to 925 ft, 935 to 945 ft, 960 to 1,000 ft, and 1,032 to 1,047 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 105.89 ft above NGVD of 1929.

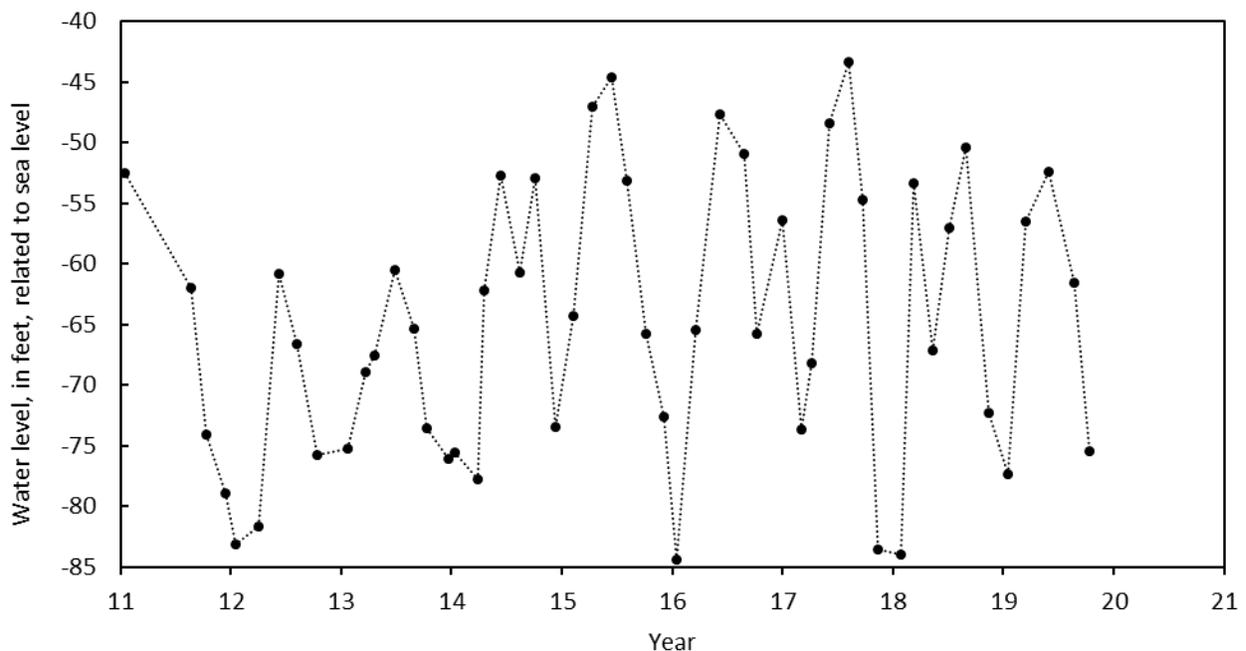
MEASURING POINT: Top of recorder platform 0.0 ft at land surface.

PERIOD OF RECORD: September 2011 to current year.

EXTREMES FOR RECORD: Highest water level measured at 149.22 ft below land surface, on April 6, 2018; lowest measured at 190.27 ft below land surface, on September 16, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Jul 15, 2019	178.22	Nov 15, 2019	162.40	Apr 23, 2020	167.46
Sep 18, 2019	183.21	Jan 30, 2020	158.27	Jun 12, 2020	181.33



WELL NUMBER: AA Cg 22

PERMIT NUMBER: AA-73-8606

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76° 24' 16"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,760 ft.

Casing diameter: 10 in. to 163 ft; 4 in. to 1,735 ft, and from 1,755 to 1,760 ft.

Screen diameter: 4 in. from 1,735 to 1,755 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 12.61 ft above NGVD of 1929.

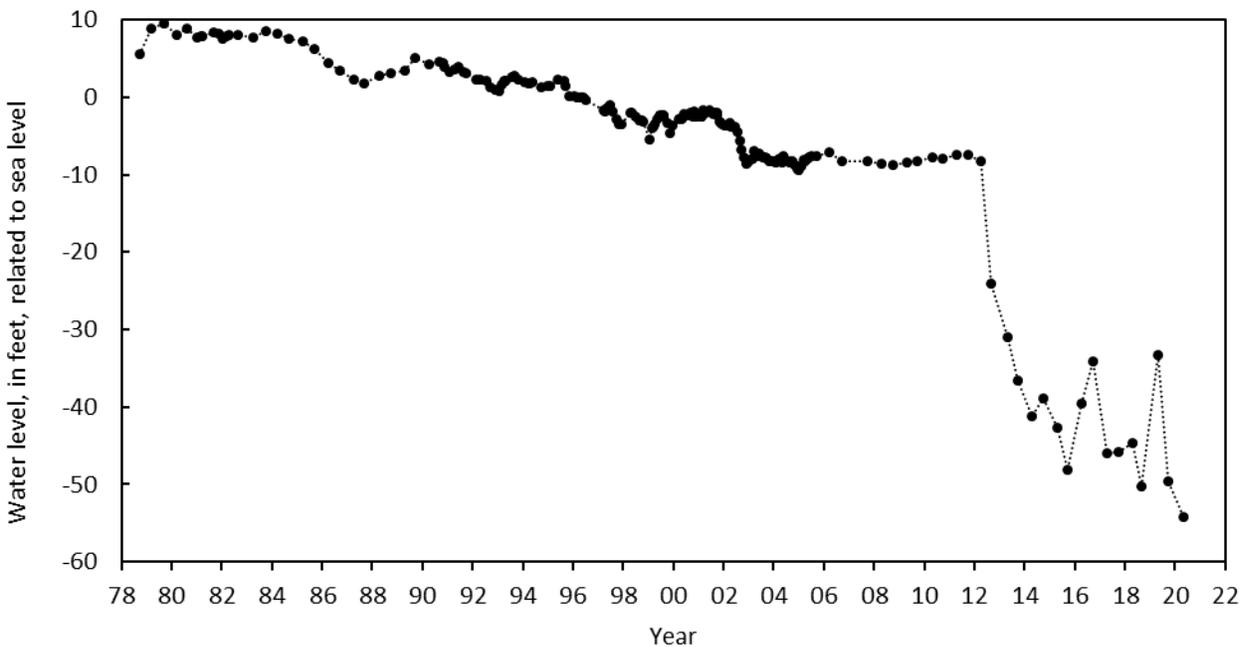
MEASURING POINT: Top of casing 3.44 ft above land surface.

PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 3.14 ft below land surface, on September 6, 1979; lowest measured at 66.81 ft below land surface, on April 28, 2020.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 23, 2019	62.25
Apr 28, 2020	66.81



WELL NUMBER: AA Cg 23

PERMIT NUMBER: AA-73-8959

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76°24' 16"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 986 ft.

Casing diameter: 10 in. to 163 ft; 4 in. to 968 ft and 978 to 986 ft.

Screen diameter: 4 in. from 968 to 978 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 12.57 ft above NGVD of 1929.

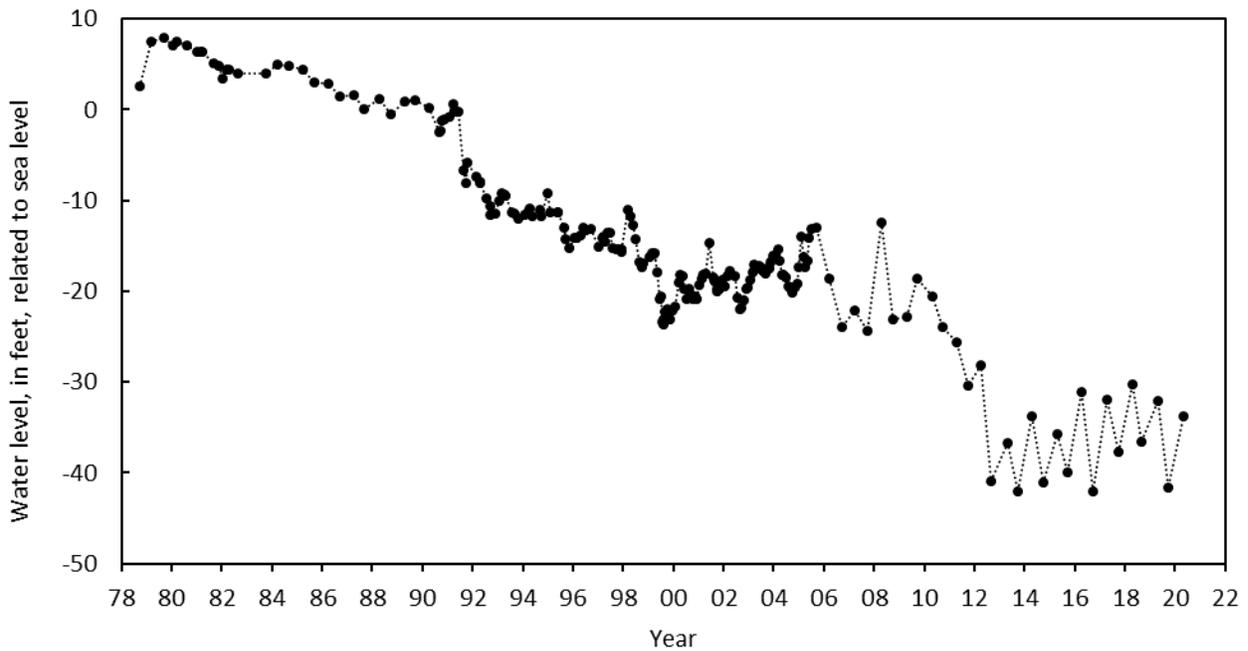
MEASURING POINT: Top of recorder platform 3.43 ft above land surface.

PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 4.65 ft below land surface, on September 6, 1979; lowest measured at 54.64 ft below land surface, on September 20, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 23, 2019	54.13
Apr 28, 2020	46.40



WELL NUMBER: AA Cg 24

PERMIT NUMBER: AA-73-8960

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76° 24' 16"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 664 ft.

Casing diameter: 12 in. to 68 ft; 6 in. to 158 ft; 4 in. from 158 to 605 ft, 615 to 648 ft, and 658 to 664 ft.

Screen diameter: 4 in. from 605 to 615 ft, and 648 to 658 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 12.68 ft above NGVD of 1929.

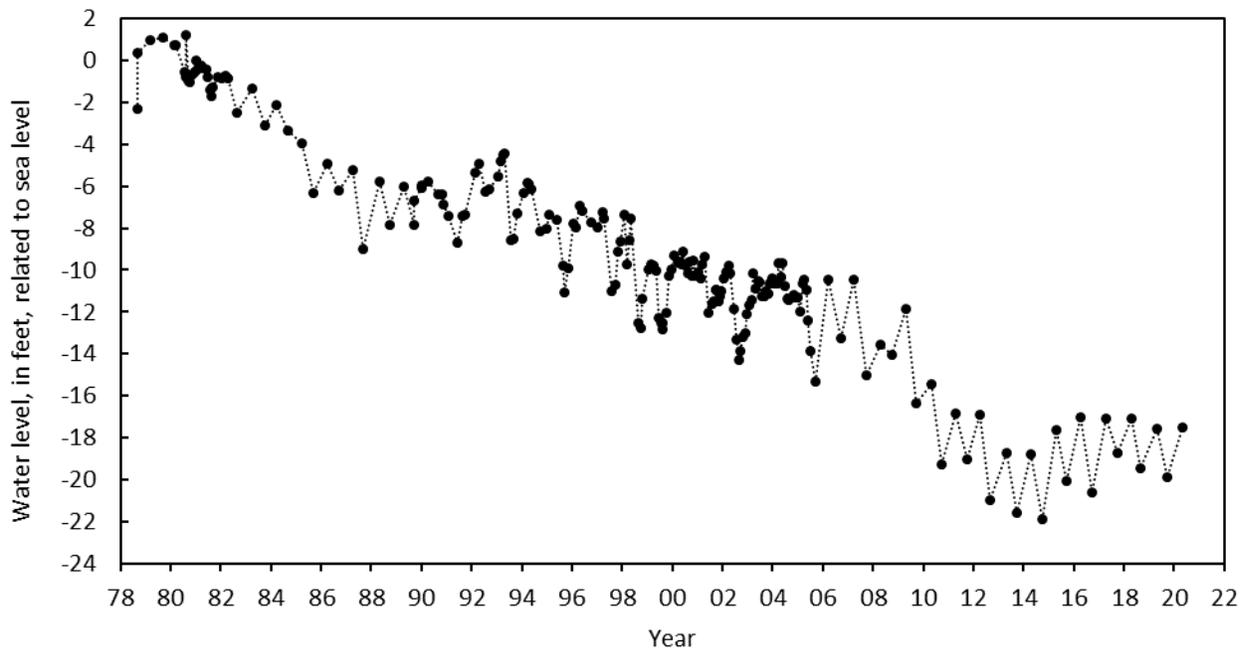
MEASURING POINT: Top of recorder platform 3.16 ft above land surface.

PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 11.47 ft below land surface, on August 15, 1980; lowest measured at 34.59 ft below land surface, on September 26, 2014.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 23, 2019	32.54
Apr 28, 2020	30.21



WELL NUMBER: AA Dd 42

PERMIT NUMBER: AA-71-0231

LOCATION: Route 50 and Howard Grove Road

LAT. 38° 58' 08", LONG. 76°37' 35"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 275 ft.

Casing diameter: 4 in. to 190 ft; 2 in. from 220 to 225 ft, and 235 to 265 ft.

Screen diameter: 2 in. from 190 to 200 ft, 225 to 235 ft, and 265 to 275 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 105.48 ft above NGVD of 1929.

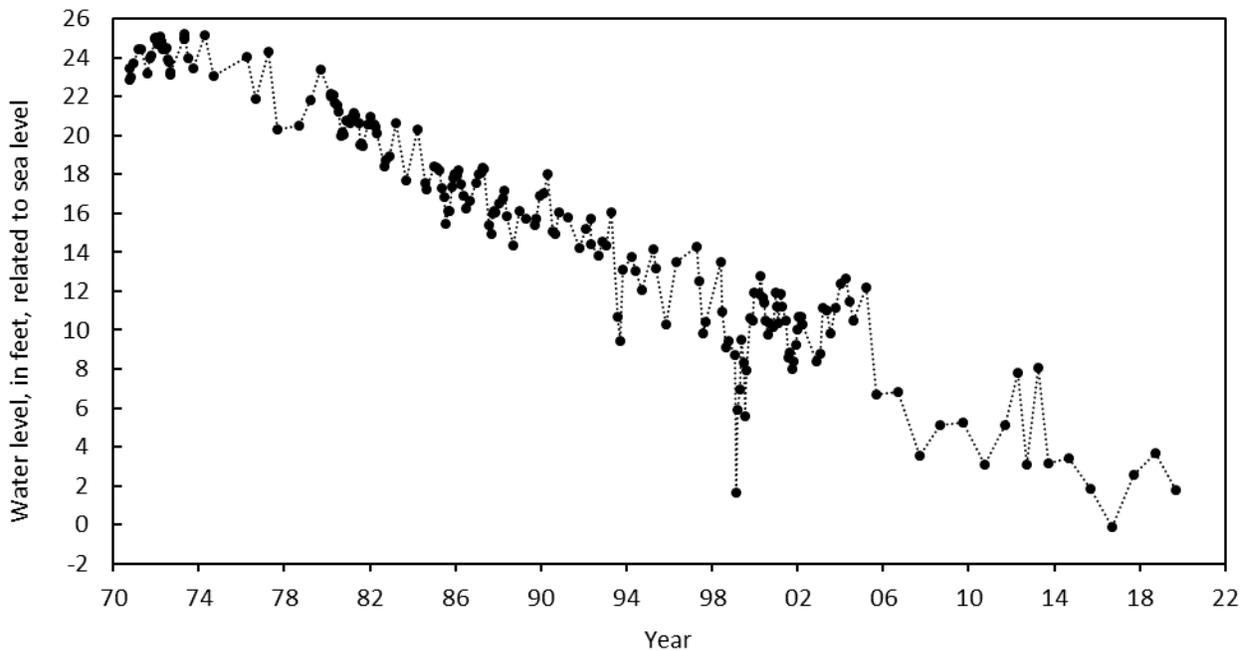
MEASURING POINT: Top of casing 0.72 ft above land surface.

PERIOD OF RECORD: October 1970 to current year.

EXTREMES FOR RECORD: Highest water level measured at 80.25 ft below land surface, on May 4, 1973; lowest measured at 105.58 ft below land surface, on September 16, 2016.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 19, 2019	103.69



WELL NUMBER: AA De 1

PERMIT NUMBER: --

LOCATION: City of Annapolis

LAT. 38° 59' 15", LONG. 76° 34' 03"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 237 ft.

Casing diameter: 10 in. to 207 ft.

Screen diameter: 6 in. from 207 to 237 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 13.72 ft above NGVD of 1929.

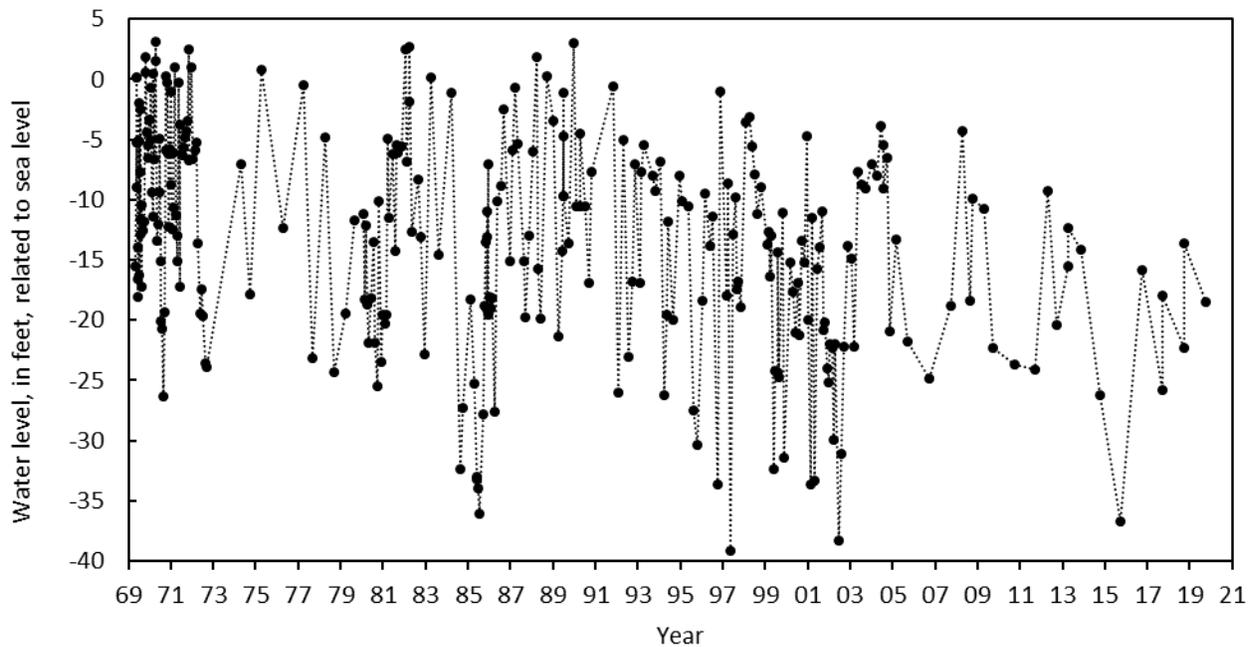
MEASURING POINT: Top of recorder platform 2.0 ft above land surface.

PERIOD OF RECORD: April 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 10.57 ft below land surface, on April 15, 1970; lowest measured at 52.9 ft below land surface, on May 18, 1997.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Oct 02, 2019	32.24



WELL NUMBER: AA De 95

PERMIT NUMBER: AA-68-0175

LOCATION: Broad Creek Water-Treatment Plant

LAT. 38° 58' 53", LONG. 76°33' 30"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 480 ft.

Casing diameter: 6 in. to 465 ft.

Screen diameter: 6 in. from 465 to 480 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 73.2 ft above NGVD of 1929.

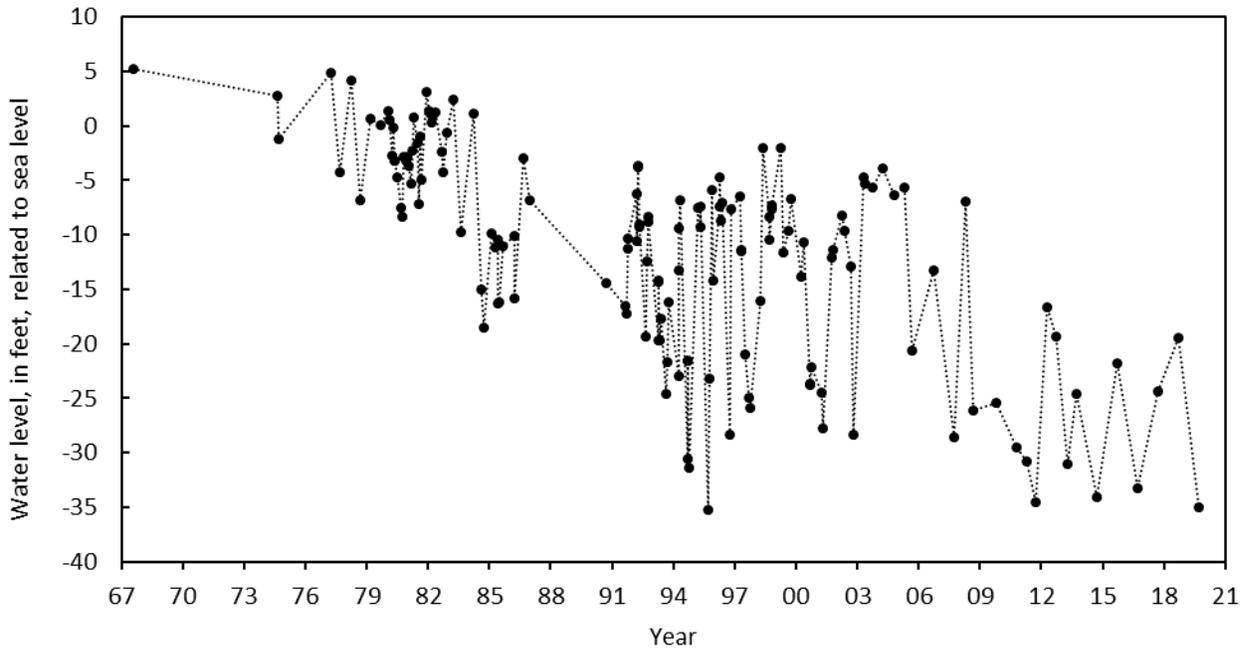
MEASURING POINT: Top of recorder platform 5.3 ft above land surface.

PERIOD OF RECORD: August 1967 to current year.

EXTREMES FOR RECORD: Highest water level measured at 68 ft below land surface, on August 11, 1967; lowest measured at 108.42 ft below land surface, on September 11, 1995.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 19, 2019	108.24



WELL NUMBER: AA De 128

PERMIT NUMBER: AA-73-8278

LOCATION: Central Avenue well field

LAT. 38°55' 30", LONG. 76° 33' 47"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 708 ft;

Casing diameter: 24 in. to 547 ft; 12 in. to 554 ft, and 644 to 686 ft;

Screen diameter: 12 in. from 554 to 644 ft, and 686 to 708 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 28.31 ft above NGVD of 1929.

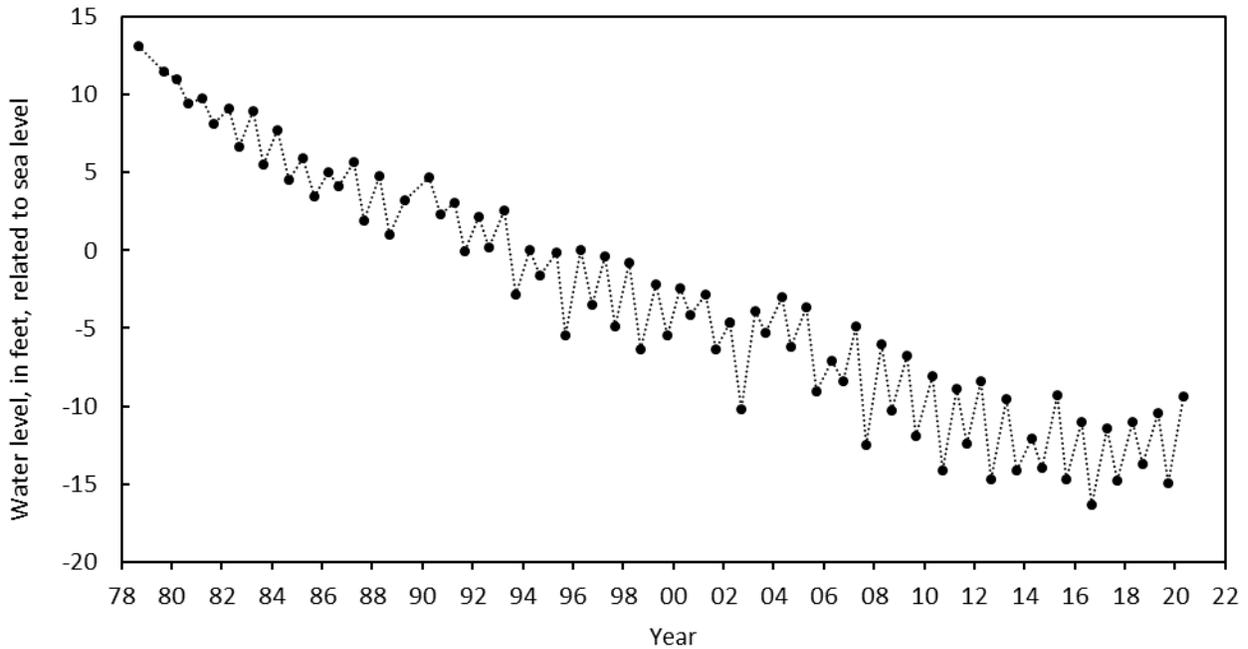
MEASURING POINT: Top of 24 in. casing 3.65 ft above land surface.

PERIOD OF RECORD: September 1978 to current year.

EXTREMES FOR RECORD: Highest water level measured at 15.15 ft below land surface, on September 1, 1978; lowest measured at 44.66 ft below land surface, on September 13, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 18, 2019	43.25
Apr 30, 2020	37.72



WELL NUMBER: AA De 206

PERMIT NUMBER: AA-88-9908

LOCATION: Broad Creek Water Treatment Plant

LAT. 38° 58' 33", LONG. 76°33' 28"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,013 ft;

Casing diameter: 4 in. to 288 ft; 2 in. from 288 to 775 ft;

Screen diameter: 2 in. from 775 to 1,013 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 81.74 ft above NGVD of 1929.

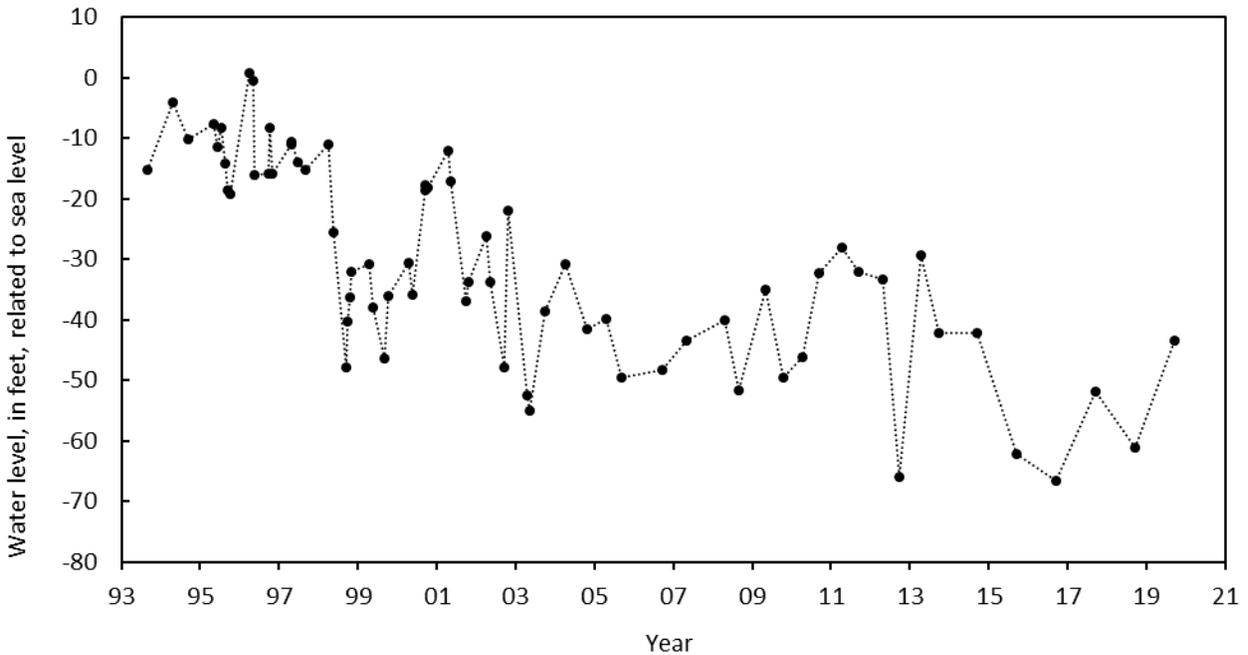
MEASURING POINT: Top of hole in flange 2.8 ft above land surface.

PERIOD OF RECORD: September 1993 to current year.

EXTREMES FOR RECORD: Highest water level measured at 80.88 ft below land surface, on April 4, 1996; lowest measured at 148.43 ft below land surface, on September 16, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 19, 2019	125.15



WELL NUMBER: AA De 219

PERMIT NUMBER: AA-94-8258

LOCATION: City of Annapolis

LAT. 38° 59' 15", LONG. 76° 33' 53"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 520 ft;

Casing diameter: 24 in. to 436 ft; 12 in. from 367 to 427 ft.

Screen diameter: 12 in. from 427 to 432 ft, 440 to 460 ft, 466 to 472 ft, 476 to 482 ft, 492 to 500 ft, and 506 to 515 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 120 ft above NGVD of 1929.

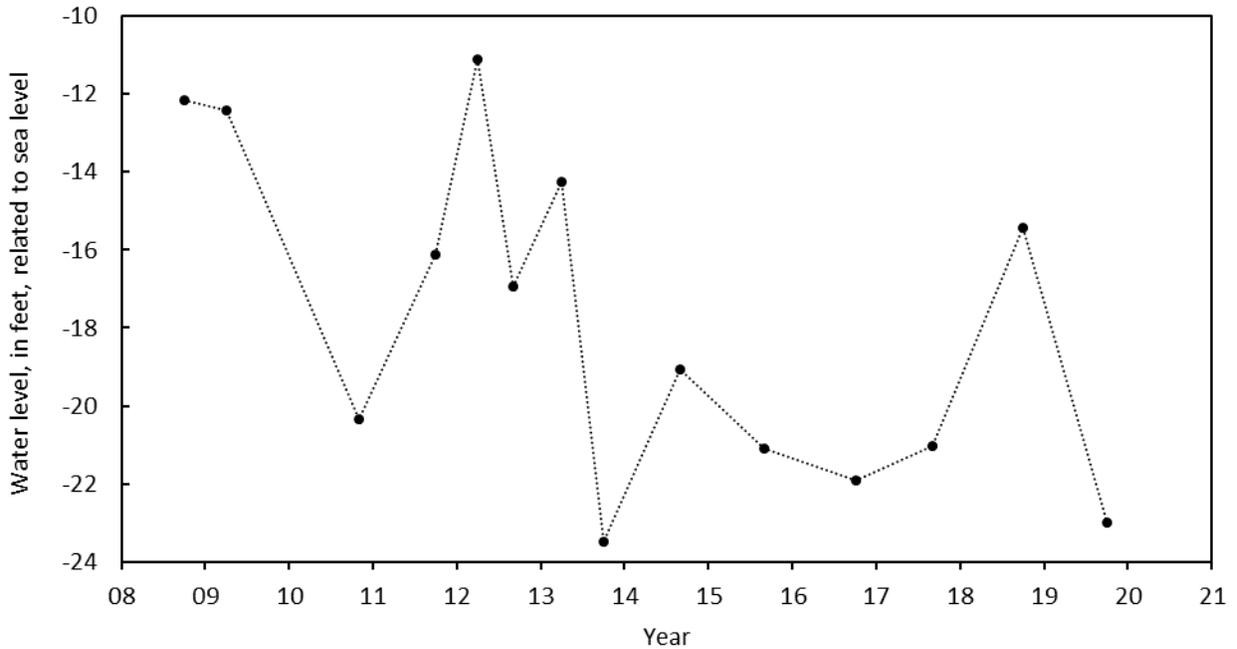
MEASURING POINT: Top of 2-inch measuring tube 3 ft above land surface.

PERIOD OF RECORD: October 2008 to current year.

EXTREMES FOR RECORD: Highest water level measured at 131.1 ft below land surface, on April 24, 2012; lowest measured at 143.48 ft below land surface, on October 1, 2013.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Oct 01, 2019	142.99



WELL NUMBER: AA De 232

PERMIT NUMBER: AA-95-4626

LOCATION: City of Annapolis

LAT. 38°59' 18", LONG. 76°33' 53"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,173 ft;

Casing diameter: 24 in. to 829 ft; 14 in. from 739 to 834 ft, 856 to 871 ft, 878 to 886 ft, 894 to 902 ft, 936 to 958 ft, 970 to 1,009 ft, 1,014 to 1,070 ft, and 1,120 to 1,130 ft.

Screen diameter: 14 in. from 834 to 856 ft, 871 to 878 ft, 886 to 894 ft, 902 to 936 ft, 958 to 970 ft, 1,009 to 1,014 ft, 1,070 to 1,120 ft, and 1,130 to 1,146 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 119 ft above NGVD of 1929.

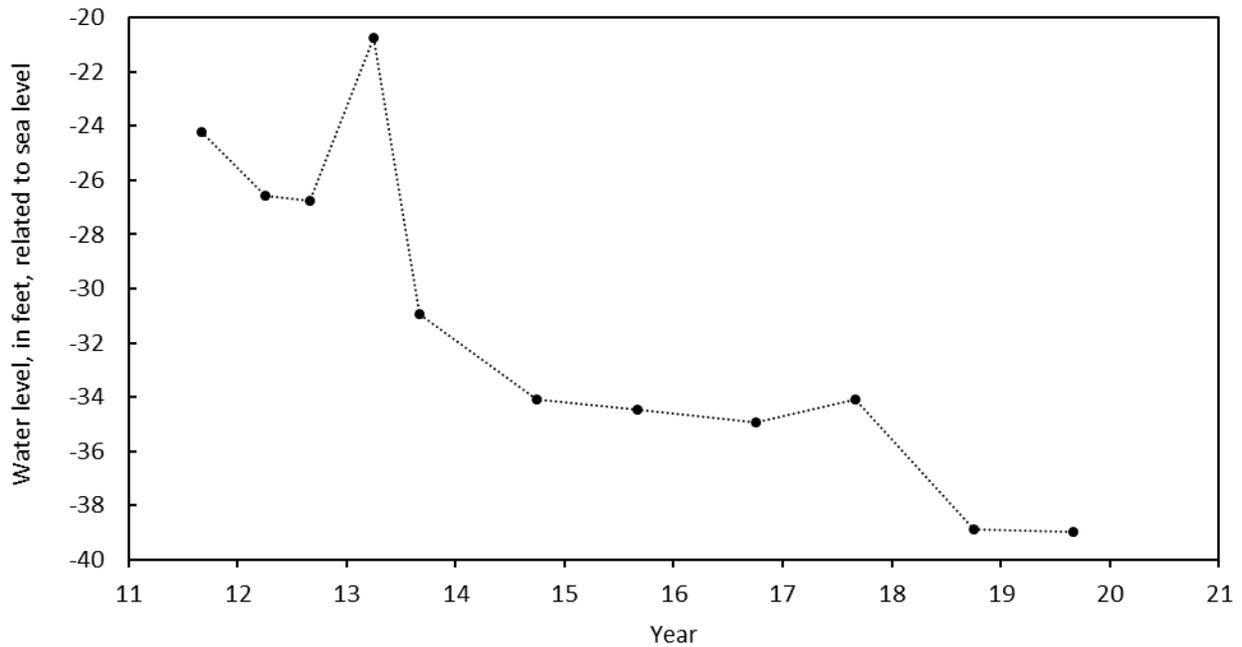
MEASURING POINT: Top of 2-inch measuring tube 1.8 ft above land surface.

PERIOD OF RECORD: September 2011 to current year.

EXTREMES FOR RECORD: Highest water level measured at 139.74 ft below land surface, on April 17, 2013; lowest measured at 157.98 ft below land surface, on September 30, 2019.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 30, 2019	157.98



WELL NUMBER: AA Df 19

PERMIT NUMBER: --

LOCATION: U.S. Navy Radio Station

LAT. 38° 59' 22", LONG. 76° 27' 04"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 590 ft;

Casing diameter: 10 in. to 565 ft;

Screen diameter: 10 in. from 565 to 590 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 15.84 ft above NGVD of 1929.

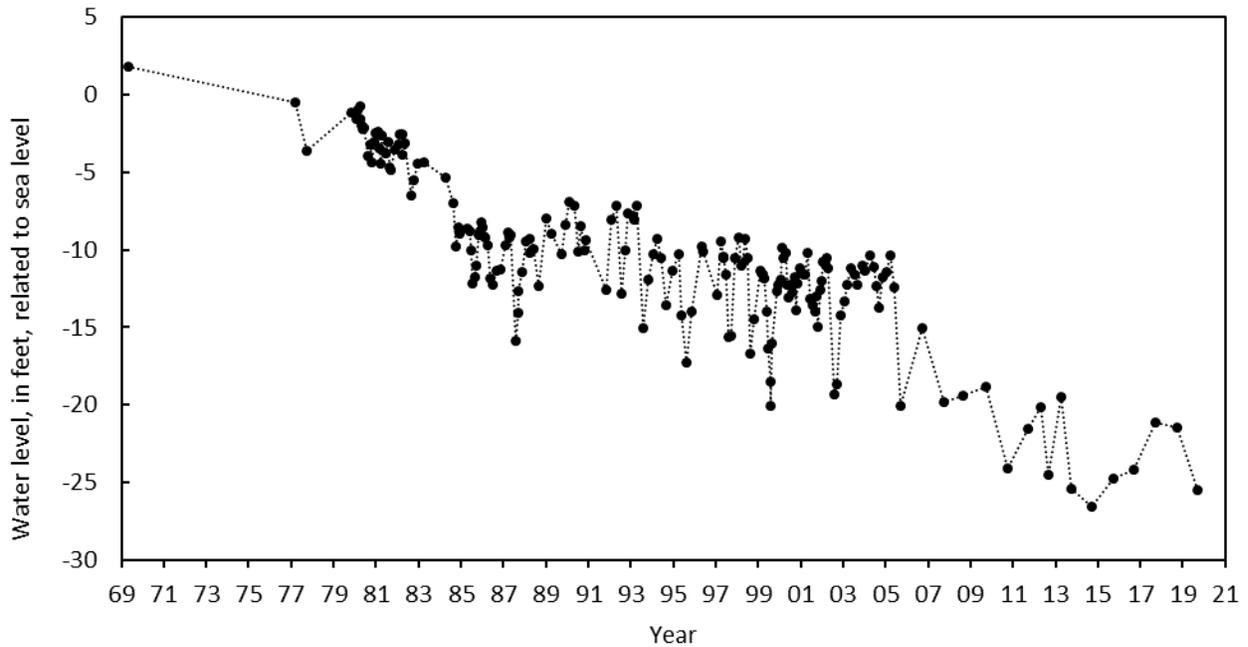
MEASURING POINT: Top of flange 2.5 ft above land surface.

PERIOD OF RECORD: May 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 14 ft below land surface, on May 1, 1969; lowest measured at 42.37 ft below land surface, on September 10, 2014.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 20, 2019	41.34



WELL NUMBER: AA Df 20

PERMIT NUMBER: --

LOCATION: U.S. Navy Radio Station

LAT. 38° 59' 16", LONG. 76° 27' 07"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 255 ft.

Casing diameter: 10 in. to 150 ft; 8 in. from 135 to 233 ft;

Screen diameter: 8 in. from 233 to 253 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 21.87 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

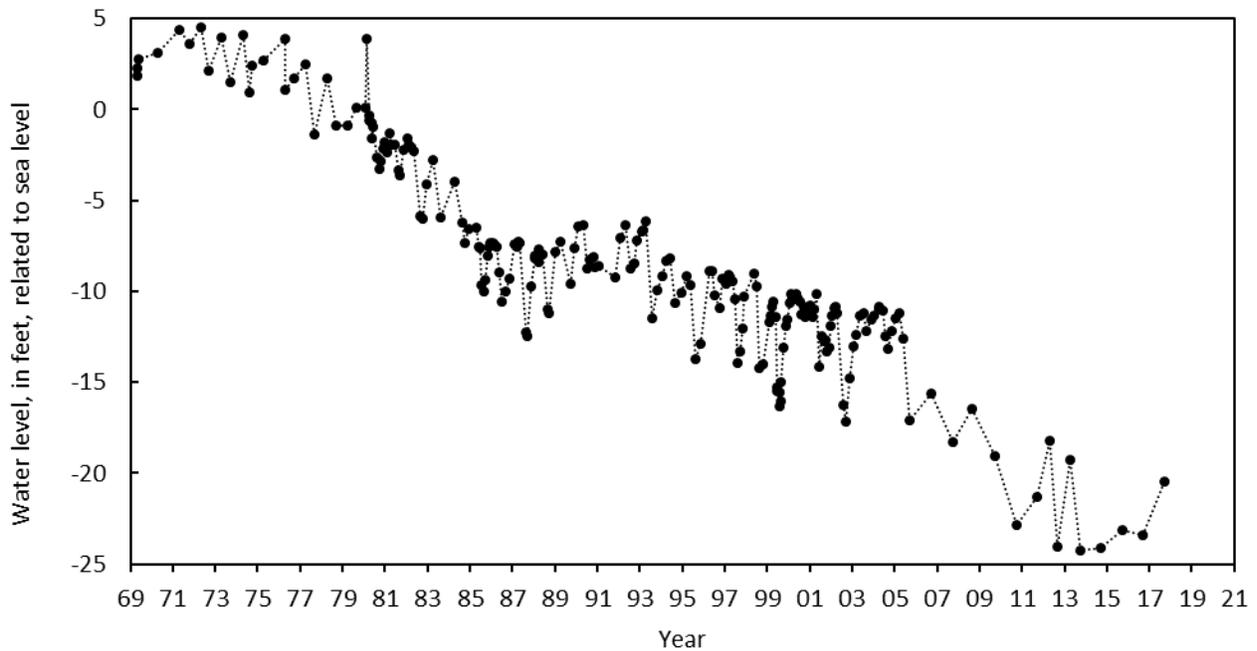
PERIOD OF RECORD: May 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 17.35 ft below land surface, on April 25, 1972; lowest measured at 46.12 ft below land surface, on September 23, 2013.

REMARKS: Water levels last measured on Sept 12, 2017. Well currently inaccessible due to construction on site.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 12, 2017	42.30



WELL NUMBER: AA Df 79
LOCATION: U.S. Naval Academy

PERMIT NUMBER: AA-03-7867
LAT. 38° 59' 05", LONG. 76° 29' 36"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 705 ft.

Casing diameter: 6 in. to 300 ft; 320 to 572 ft, and 592 to 675 ft;

Screen diameter: 6 in. from 300 to 320 ft, 572 to 592 ft, and 675 to 695 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 5.17 ft above NGVD of 1929.

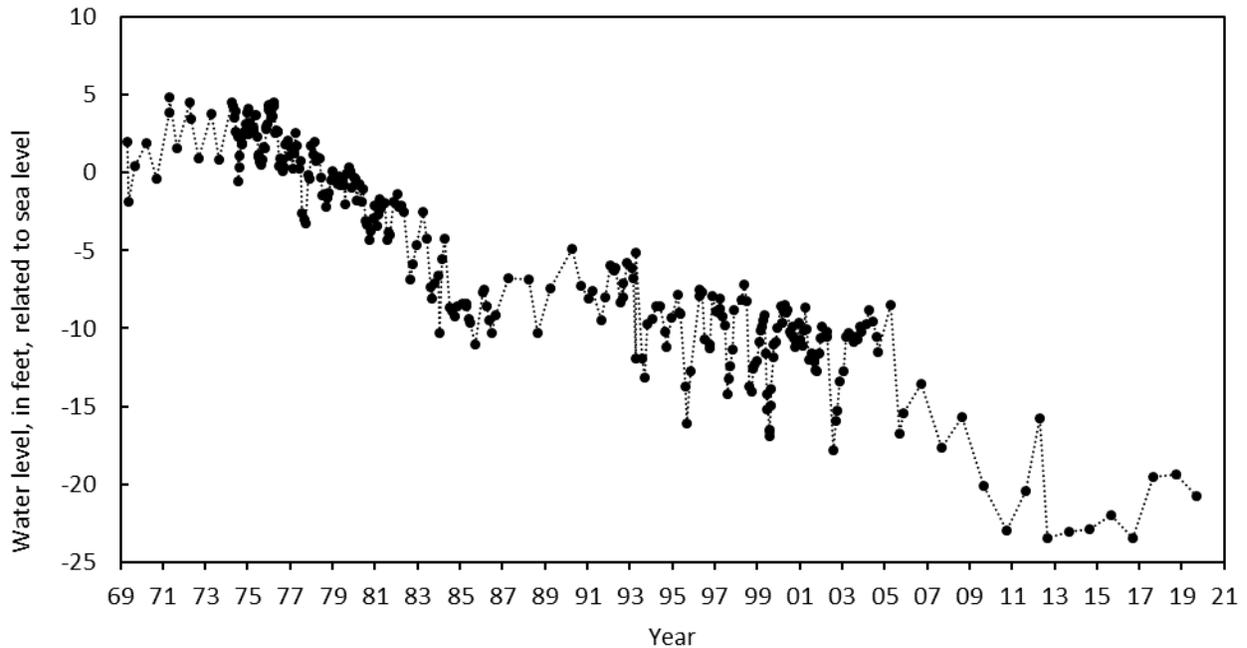
MEASURING POINT: Top of recorder platform 2.8 ft above land surface.

PERIOD OF RECORD: May 1969 to current year.

EXTREMES FOR RECORD: Highest water level measured at 0.33 ft below land surface,
on April 29, 1971; lowest measured at 28.65 ft below land surface, on September 12, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 12, 2019	25.9



WELL NUMBER: AA Fe 92

PERMIT NUMBER: AA-94-5386

LOCATION: Deale Athletic Field

LAT. 38° 46' 44", LONG. 76° 33' 12"

AQUIFER: Aquia Formation of Upper Paleocene age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 205 ft.

Casing diameter: 4.5 in. to 170 ft, and 200 to 205 ft.

Screen diameter: 4.5 in. from 170 to 200 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 9 ft above sea level from topographic map.

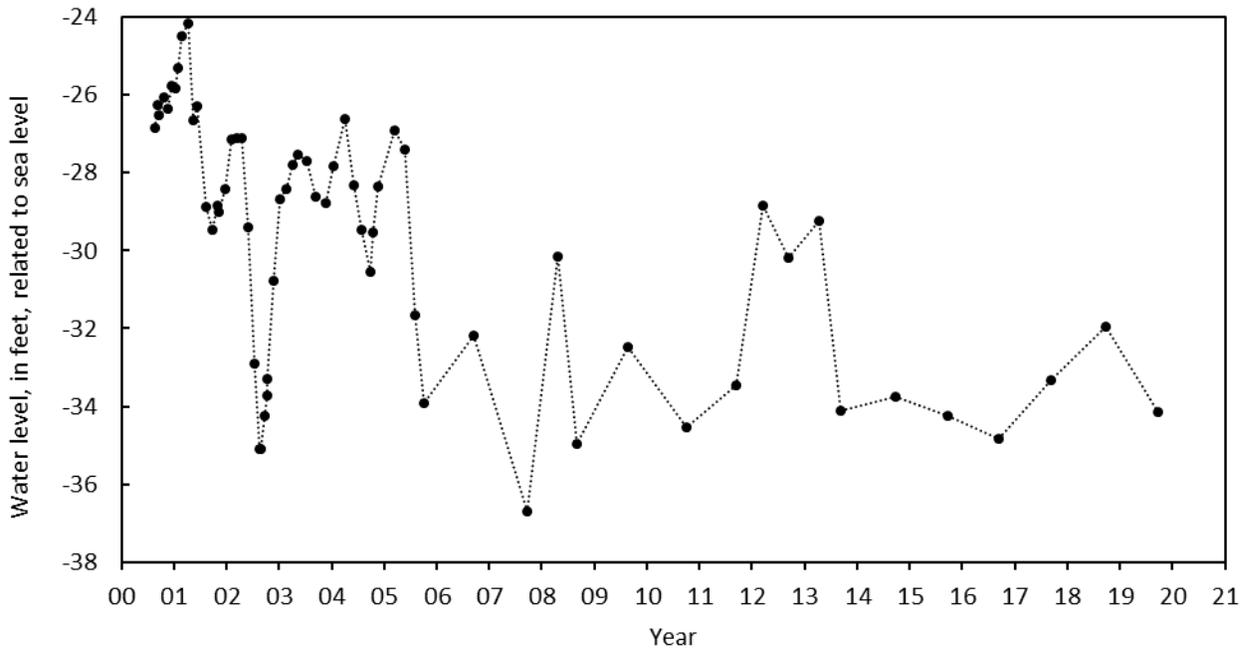
MEASURING POINT: Top of recorder platform, 3.0 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

EXTREMES FOR RECORD: Highest water level measured at 33.17 ft below land surface, on April 6, 2001; lowest measured at 45.7 ft below land surface, on September 20, 2007.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 19, 2019	43.13



WELL NUMBER: AA Fe 93
LOCATION: Deale Athletic Field

PERMIT NUMBER: AA-94-5391
LAT. 38° 46' 44", LONG. 76° 33' 12"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 470 ft.

Casing diameter: 4.5 in. to 429 ft, 449 to 454 ft, and 464 to 470 ft.

Screen diameter: 4.5 in. from 429 to 449 ft, and 454 to 464 ft.

INSTRUMENTATION: Periodic measurements.

DATUM: Altitude of land surface is 9 ft above sea level from topographic map.

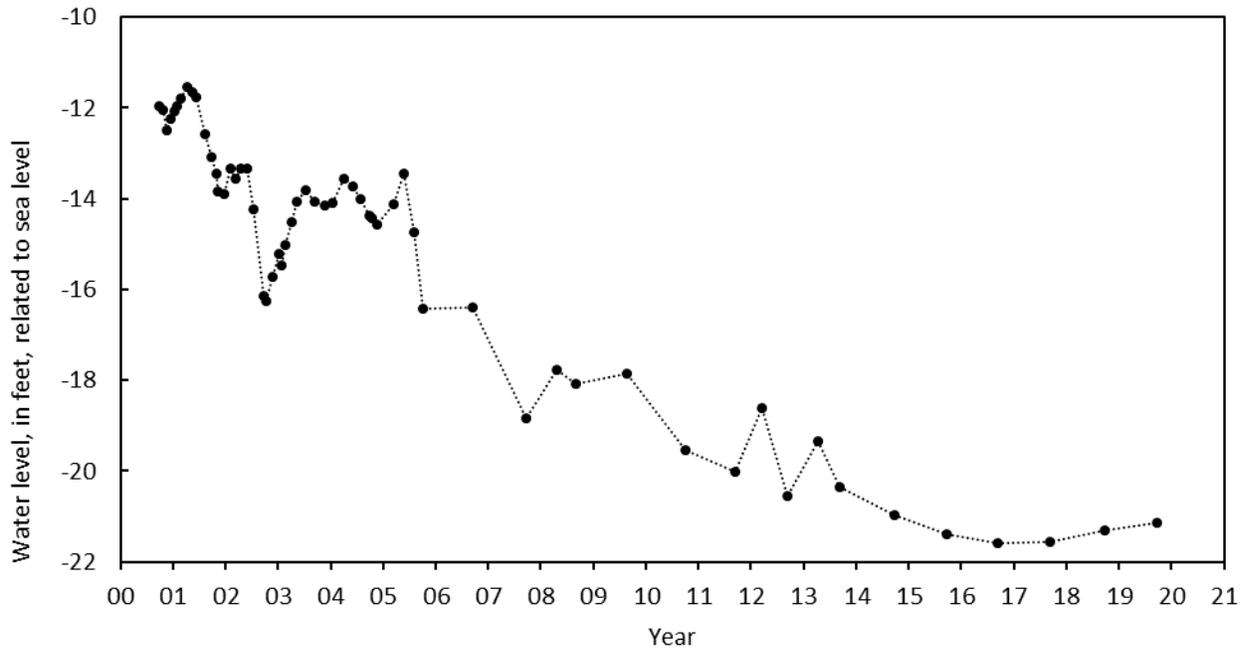
MEASURING POINT: Top of recorder platform, 3.35 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

EXTREMES FOR RECORD: Highest water level measured at 18.75 ft below land surface, on April 6, 2001; lowest measured at 28.82 ft below land surface, on September 12, 2016.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL
Sep 19, 2019	28.37



GAGE NUMBER: 01589500

LAT. 39° 10' 12", LONG. 76° 37' 51"

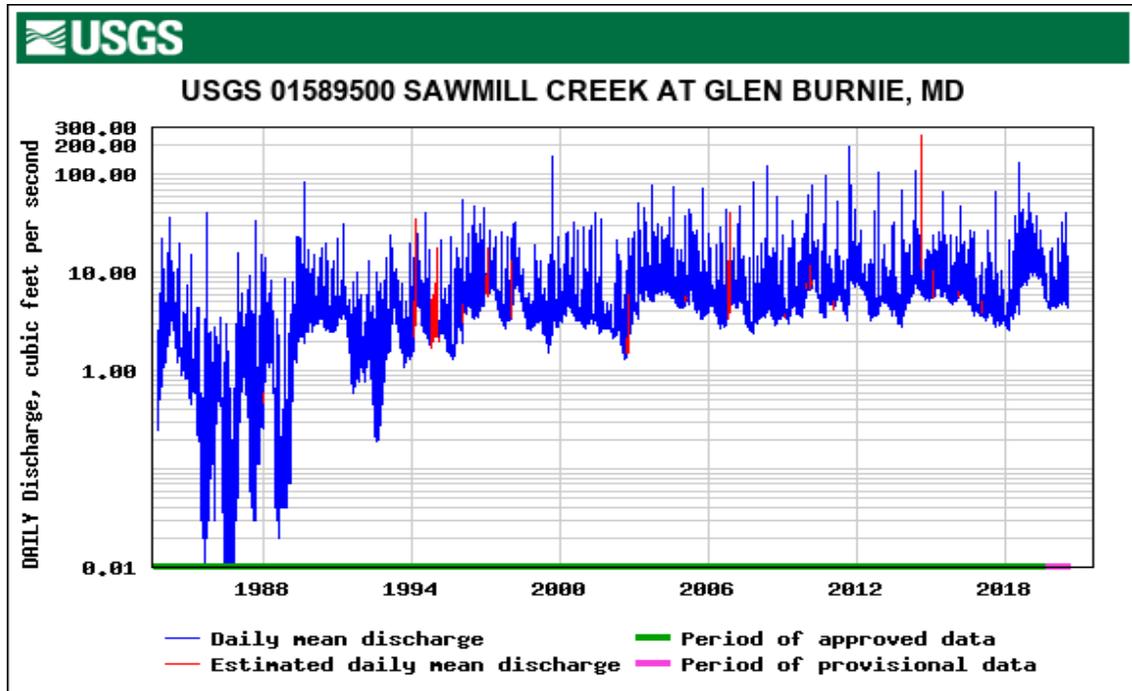
LOCATION: Sawmill Creek

DRAINAGE AREA: 4.97 mi².

GAGE: Water-stage recorder and concrete control. Datum of gage is 26.07 ft above NGVD of 1929.

PERIOD OF RECORD: May 1944 to September 1952. Annual maximum, water years 1965-70.

September 1983 to current year.



TABLES AND GRAPHS SHOWING GROUND WATER
WITHDRAWALS AND WATER LEVELS



Figure 2: Location of observation wells and well field in Anne Arundel County.

CROFTON MEADOWS

Table 1: Monthly pumpage data for the Patuxent wells in the Crofton Meadows area.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jul 2019	170,607,000	5,503,452
Aug 2019	174,300,000	5,622,581
Sep 2019	194,515,000	6,483,833
Oct 2019	152,697,000	4,925,711
Nov 2019	128,000,000	4,266,667
Dec 2019	136,300,000	4,396,774
Jan 2020	135,210,000	4,361,613
Feb 2020	113,694,000	3,920,483
Mar 2020	149,351,000	4,817,774
Apr 2020	148,469,000	4,948,967
May 2020	83,904,000	2,706,581
Jun 2020	79,948,000	2,664,933

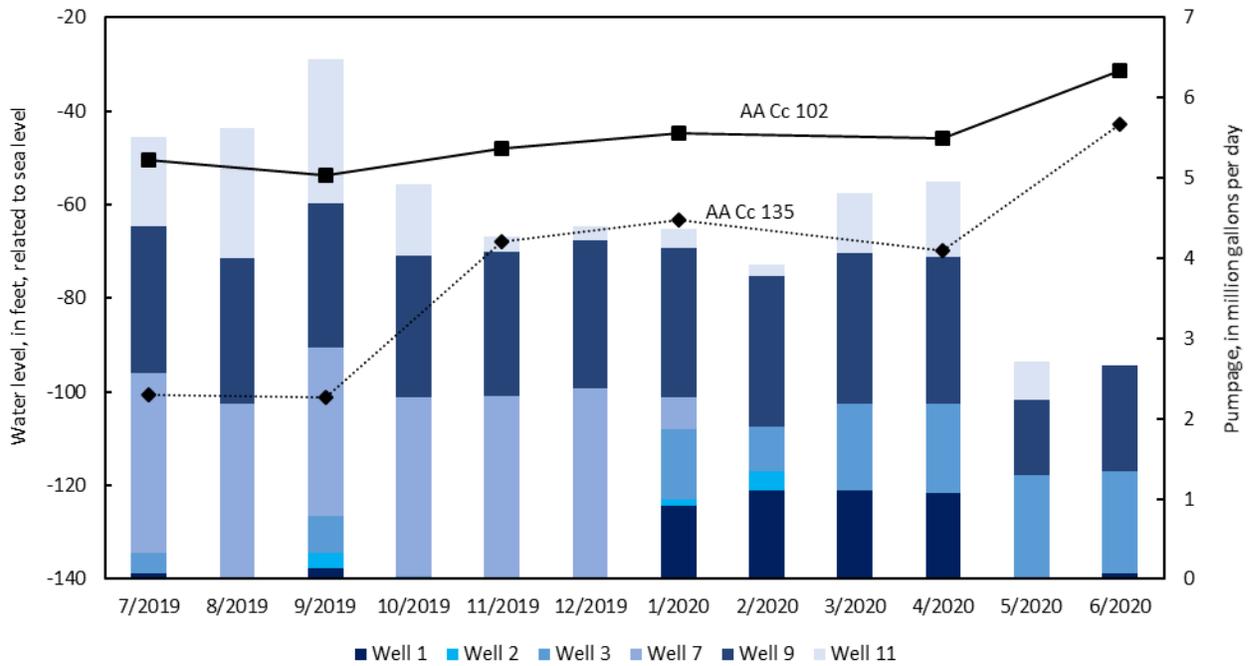


Figure 3: Monthly water level and pumpage trends in the Patuxent aquifer in the Crofton Meadows area.

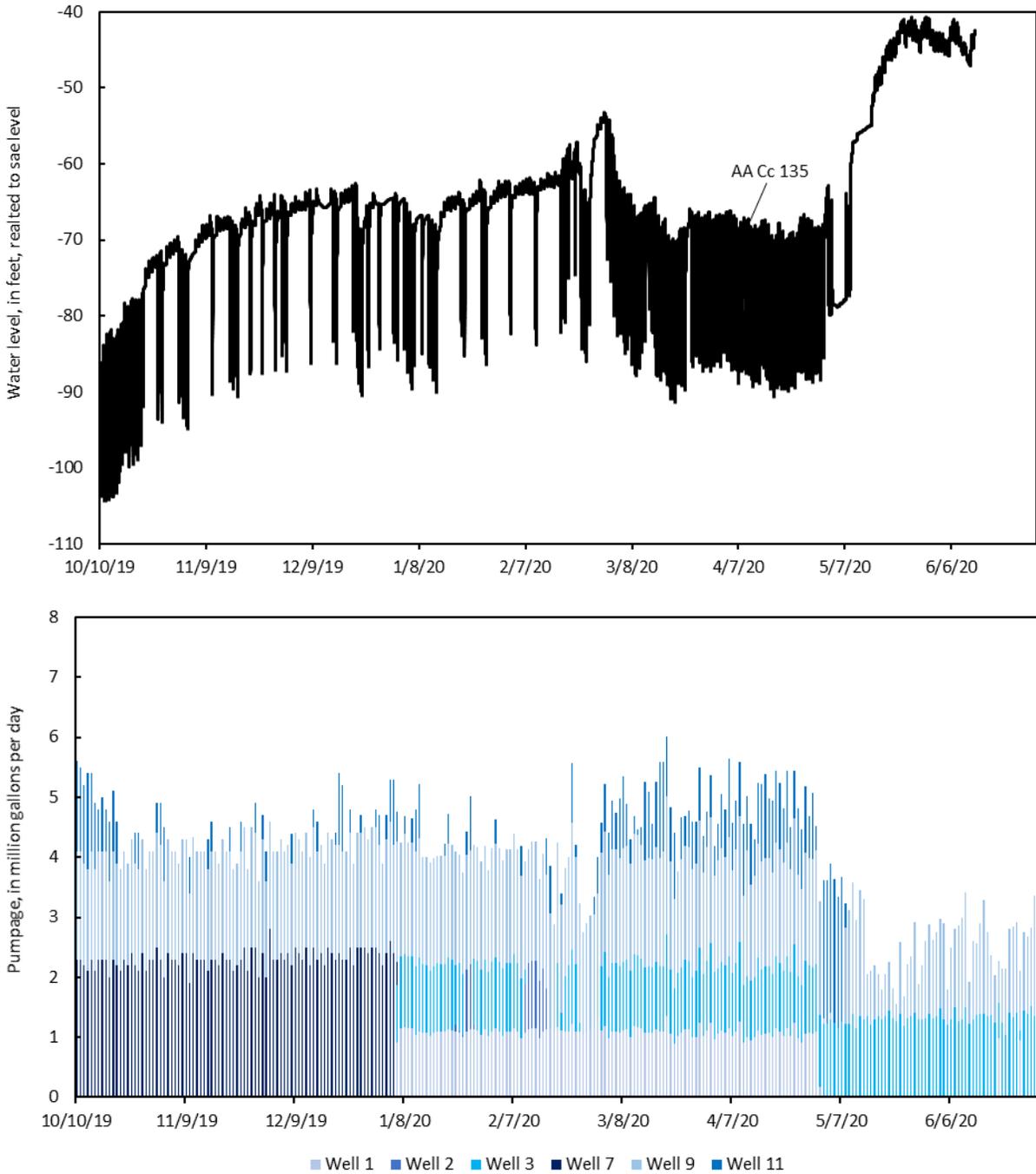


Figure 4: Daily water level and pumpage trends in the Patuxent aquifer in the Crofton Meadows area.

Table 2: Monthly pumpage data for the Lower Patapsco wells in the Crofton Meadows area.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jul 2019	198,400,000	6,400,000
Aug 2019	193,400,000	6,238,711
Sep 2019	182,400,000	6,080,000
Oct 2019	196,100,000	6,325,806
Nov 2019	194,700,000	6,490,000
Dec 2019	204,400,000	6,593,548
Jan 2020	204,554,000	6,598,516
Feb 2020	183,233,000	6,318,379
Mar 2020	171,600,000	5,535,484
Apr 2020	162,000,000	5,400,000
May 2020	252,054,000	8,130,774
Jun 2020	271,600,000	9,053,333

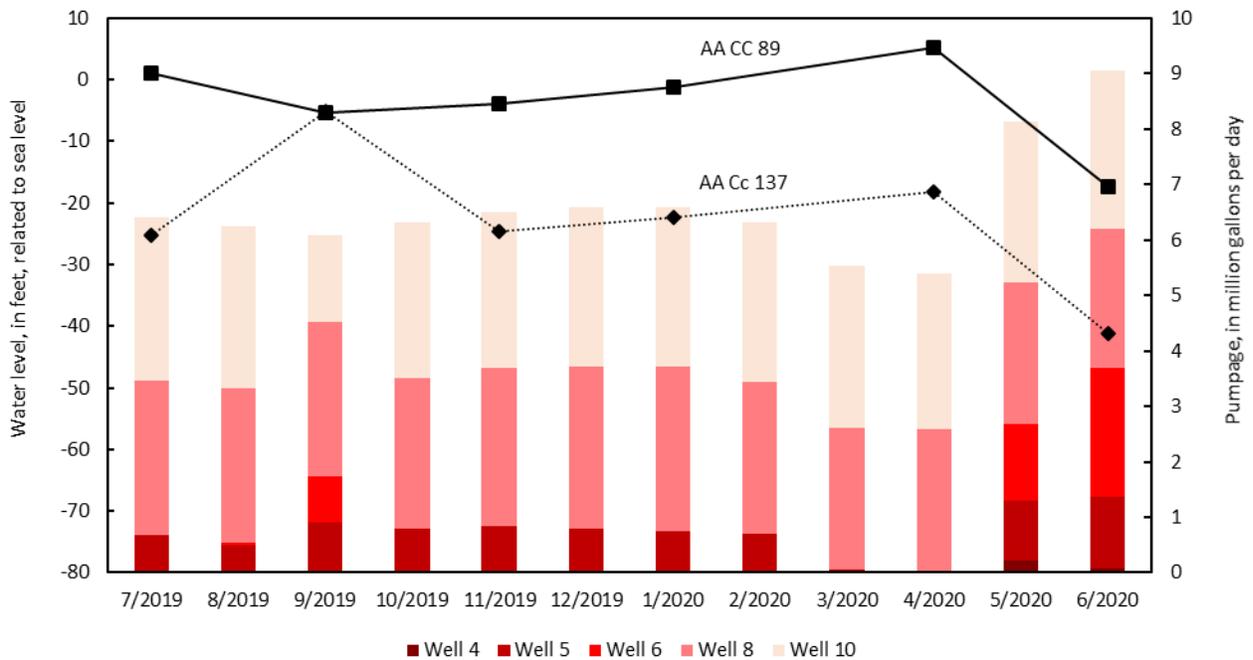


Figure 5: Monthly water level and pumpage trends in the Lower Patapsco aquifer in the Crofton Meadows area.

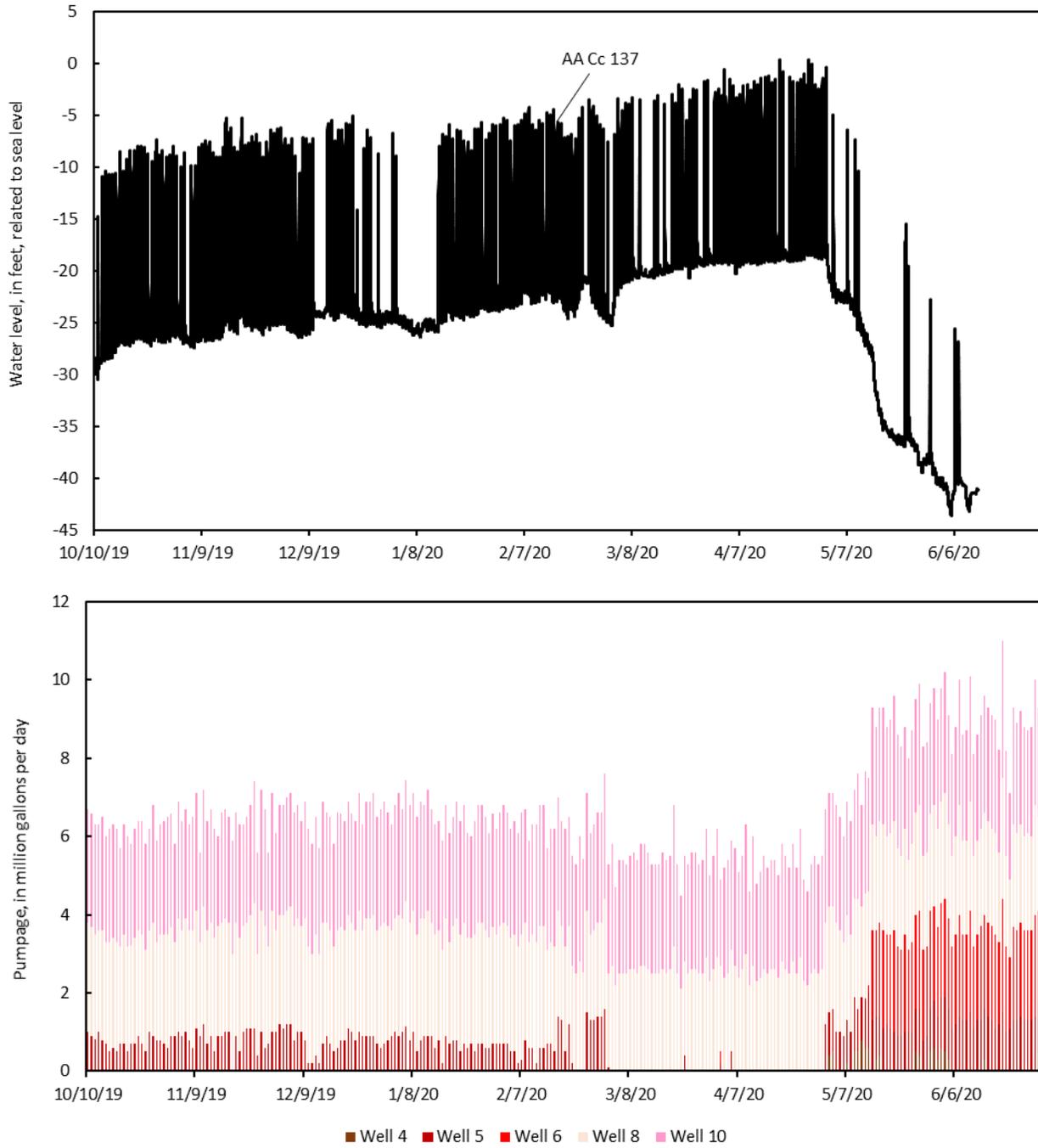


Figure 6: Daily water level and pumpage trends in the Lower Patapsco aquifer in the Crofton Meadows area.

ARNOLD

Table 3: Monthly pumpage data for the Lower Patapsco wells in the Arnold area.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jul 2019	141,548,000	4,566,065
Aug 2019	169,183,000	5,457,516
Sep 2019	191,390,000	6,379,667
Oct 2019	117,367,000	3,786,032
Nov 2019	86,678,000	2,889,267
Dec 2019	121,930,000	3,933,226
Jan 2020	90,302,000	2,912,968
Feb 2020	80,822,000	2,786,966
Mar 2020	113,329,000	3,655,774
Apr 2020	120,434,000	4,014,467
May 2020	187,082,000	6,034,903
Jun 2020	213,850,000	7,128,333

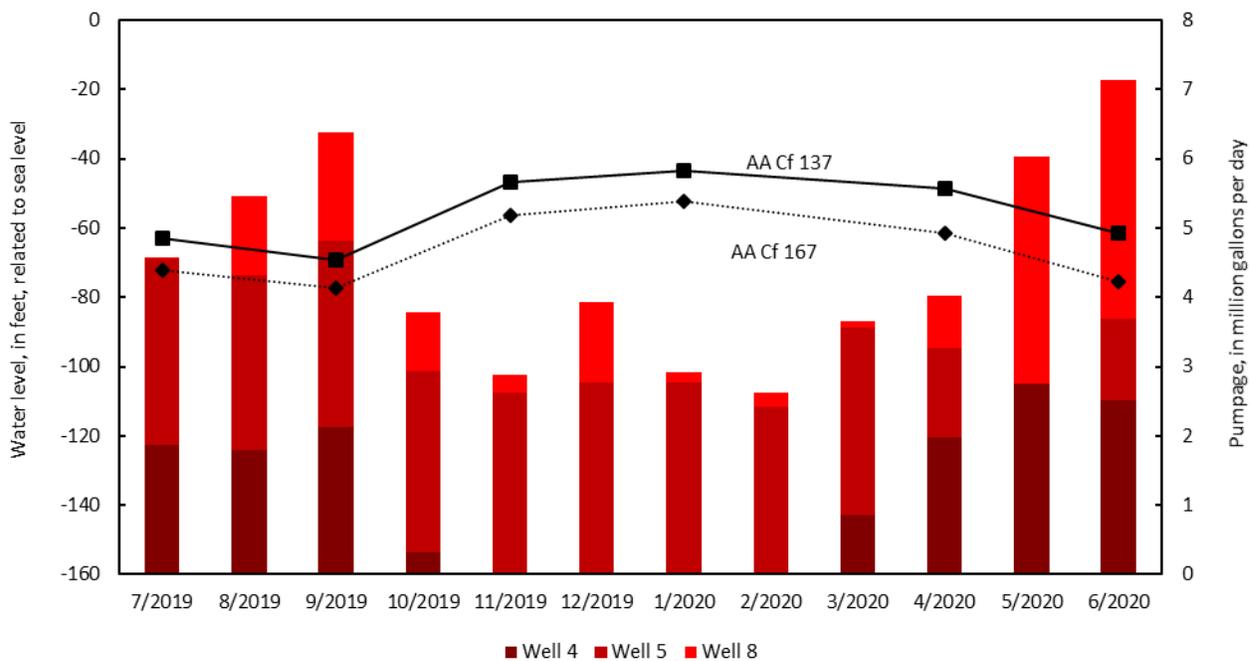


Figure 7: Monthly water level and pumpage trends in the Lower Patapsco aquifer in the Arnold area.

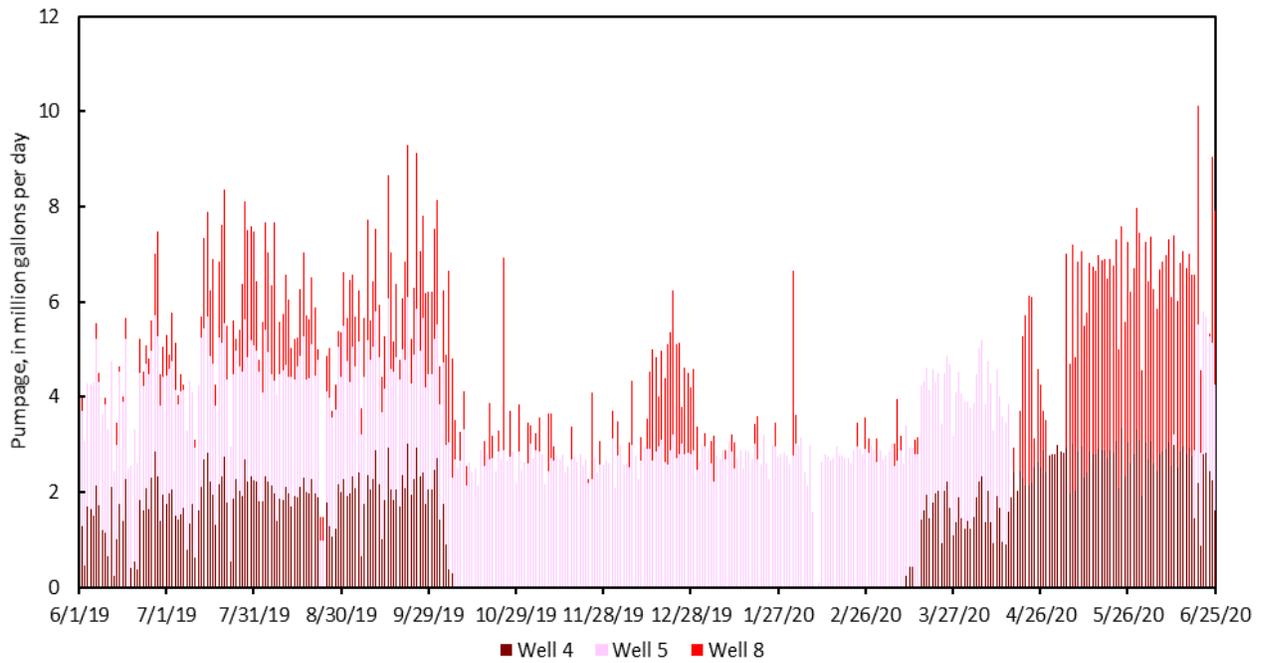
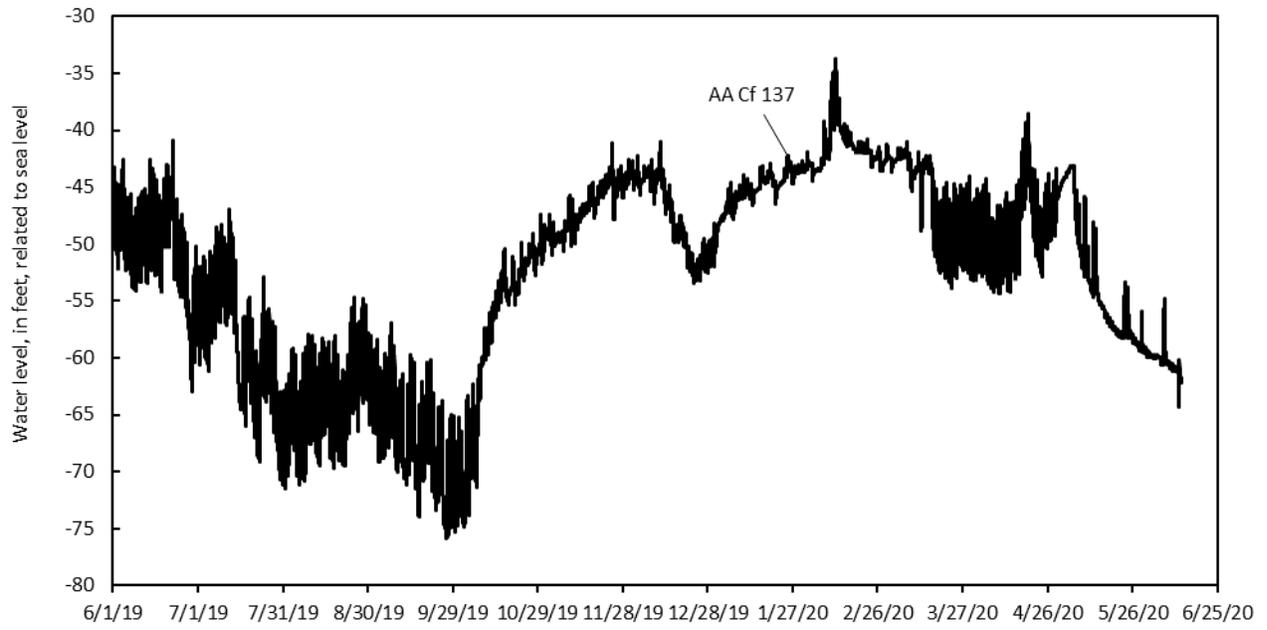


Figure 8: Daily water level and pumpage trends in the Lower Patapsco aquifer in the Arnold area.

Table 4: Monthly pumpage data for the Patuxent wells in the Arnold system.

DATE	AVERAGE WITHDRAWALS IN GALLONS PER MONTH	AVERAGE WITHDRAWALS IN GALLONS PER DAY
Jun 2019	111,518,000	3,717,267
Jul 2019	118,311,000	3,816,484
Aug 2019	116,390,000	3,754,516
Sep 2019	117,006,000	3,900,200
Oct 2019	114,402,000	3,690,387
Nov 2019	113,070,000	3,769,000
Dec 2019	122,322,000	3,945,871
Jan 2020	123,021,000	3,968,419
Feb 2020	113,322,000	3,907,655
Mar 2020	119,645,000	3,859,516
Apr 2020	107,840,000	3,594,667
May 2020	111,885,000	3,609,194
Jun 2020	112,498,000	3,749,933

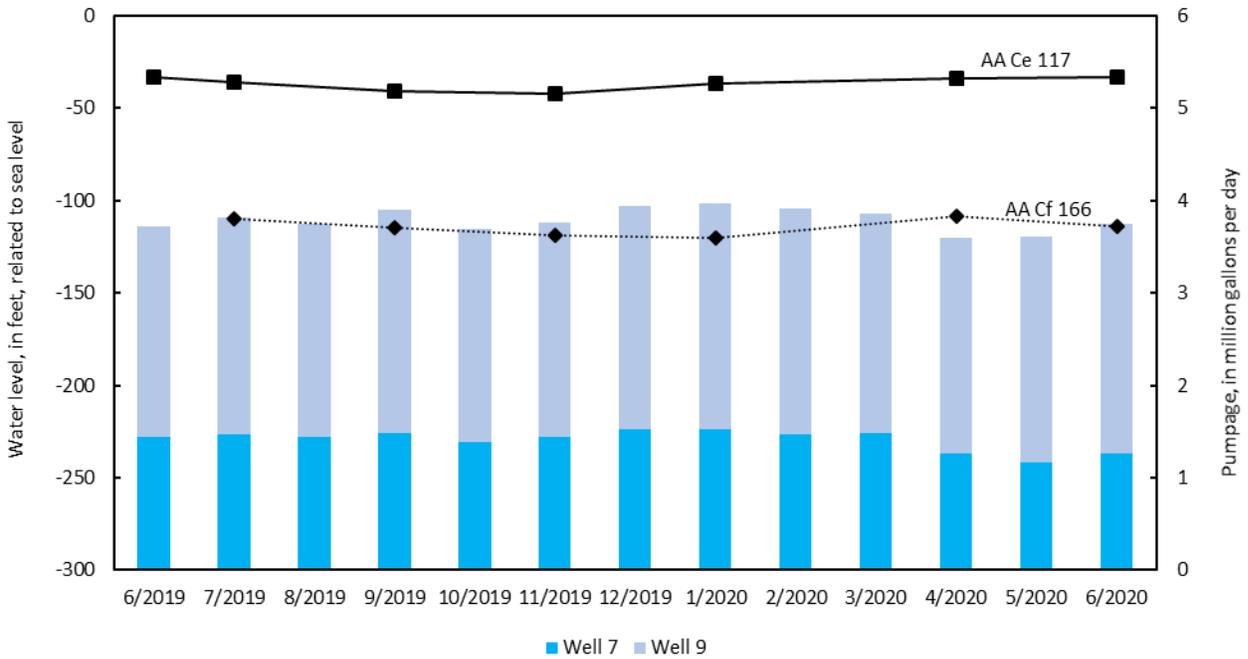


Figure 9: Monthly water level and pumpage trends in the Patuxent aquifer in the Arnold area.

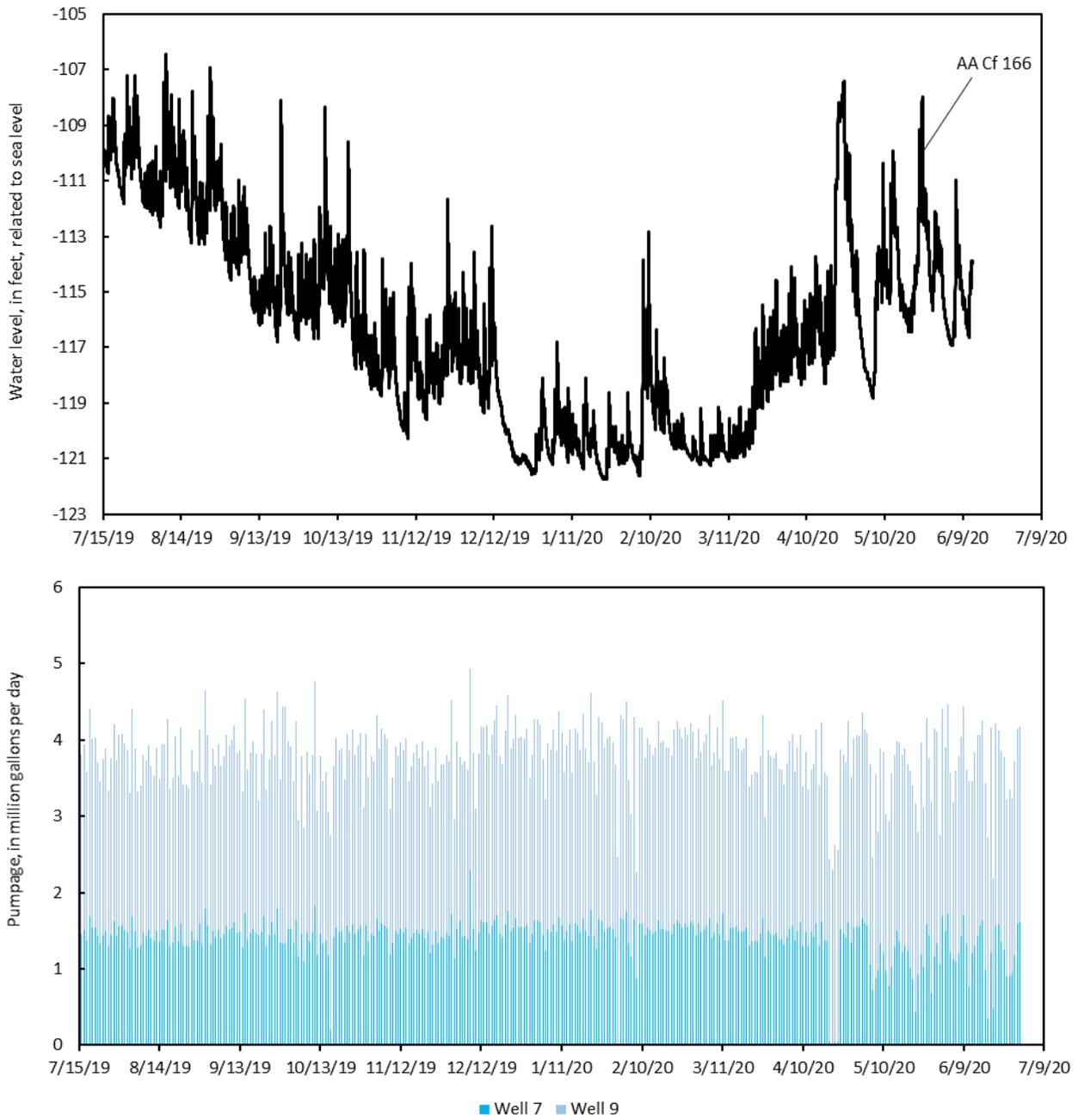


Figure 10: Daily water level and pumpage trends in the Patuxent aquifer in the Arnold area.